MARCH 1950

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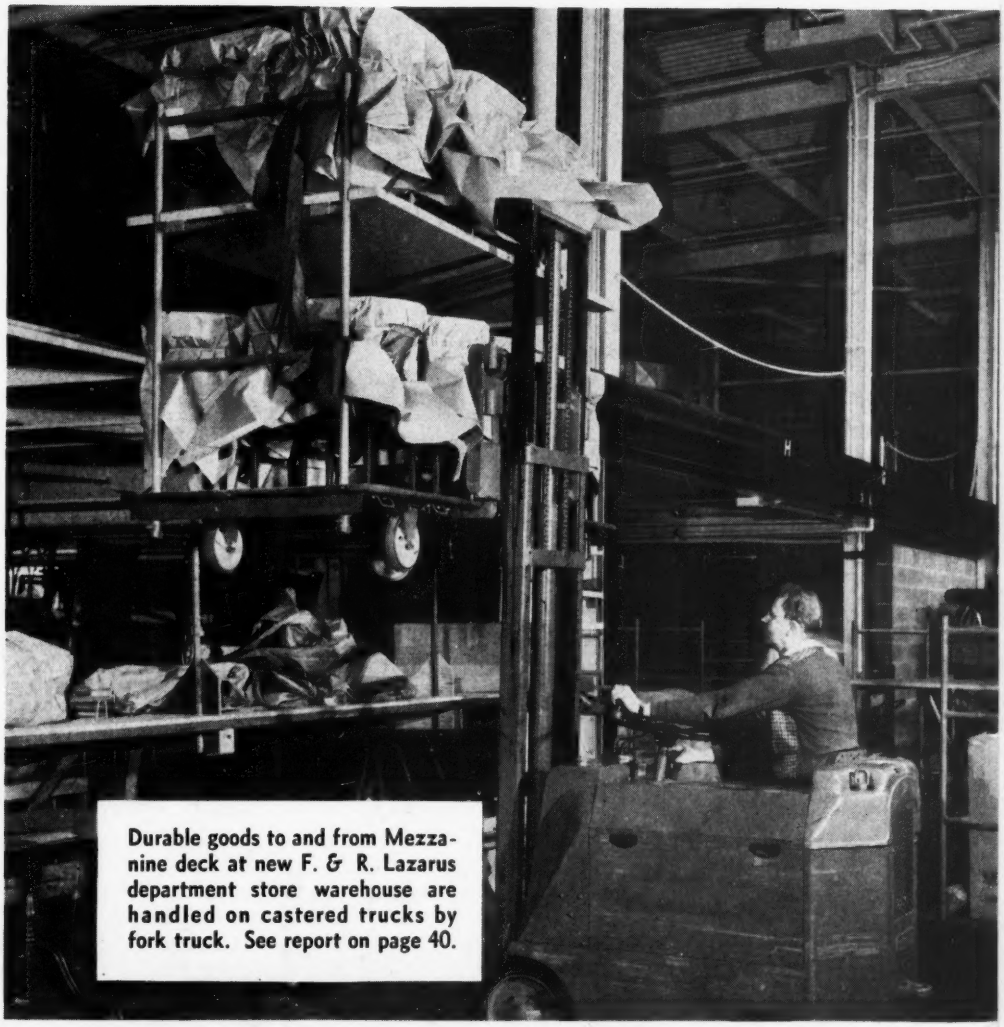
DETROIT

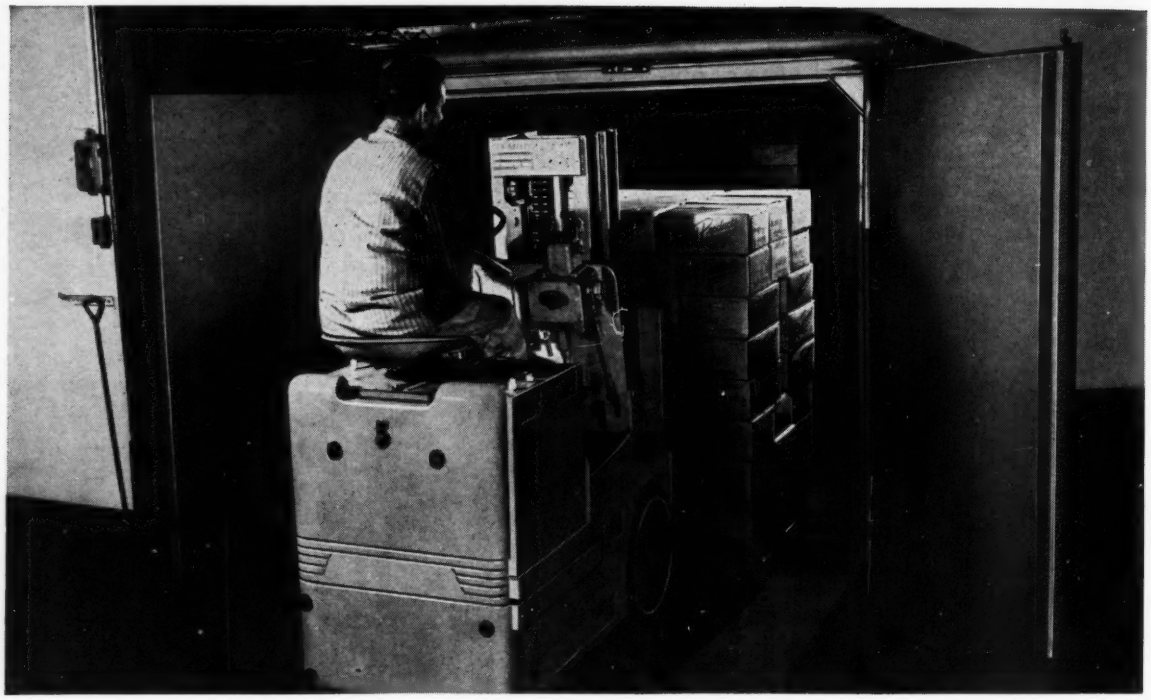
Flow

OF MATERIALS THROUGH PROPER HANDLING AND PACKAGING METHODS



Durable goods to and from Mezzanine deck at new F. & R. Lazarus department store warehouse are handled on castered trucks by fork truck. See report on page 40.

FLOW is not the official publication of any group, society or other special interest. Consequently its editorial pages are unbiased and undominated.

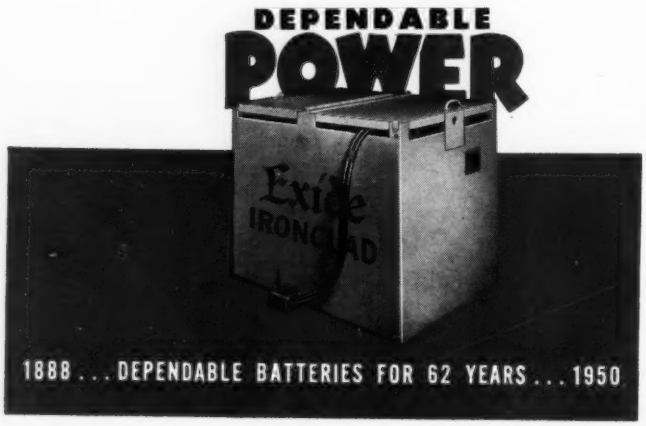


You get Split-second Handling with

Exide-Ironclad battery-POWER

Dependable Exide-Ironclad Battery power is your assurance of finger-tip control, accurate spotting, and steady operation of electric materials-handling trucks. Whether the load is light or heavy, Exide-Ironclads will deliver power instantly to meet all demands typical of *start-stop, lift* and *shift* manipulations of materials-handling trucks.

Exide-Ironclad Batteries assure full-shift trucking operations (around the clock or calendar) with no unscheduled periods of down-time to interrupt the flow of materials through your factory or warehousing operations.



The Exide-Ironclad Battery is *DIFFERENT* from all other batteries . . . different in design, construction and performance. The main difference is the Exide-Ironclad positive plate, which accounts for the superior operating characteristics and the exceptional long-life of Exide-Ironclad Batteries in more than a hundred thousand rough, heavy-duty jobs since 1910.

The operating cost of an Exide-Ironclad is low . . . a battery of average size costing less than a nickel per hour to recharge. Maintenance costs seldom exceed fifteen cents per shift. These important factors, together with the exceptional long life of Exide-Ironclad Batteries, provide the lowest cost source of *dependable, full shift* power that can be bought *at any price.*

Write for more facts and FREE copy of Exide-Ironclad Topics. It contains latest developments in materials handling . . . shows actual case histories.

THE ELECTRIC STORAGE BATTERY CO.
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

Almost Unbelievable . . . BUT TRUE!

1942 19 1950 1950

NOT EVEN ONE
Transporter Electric Truck
HAS EVER WORN OUT*

SERVICE-PROVED FEATURES LIKE THESE TELL WHY!

CHASSIS Lightweight, yet engineered and built for full capacity loads. Ruggedness combined with extra power per weight ratio.

MOTOR Heavy duty industrial truck type, series wound DC motor with high starting torque and overload capacity. To insure extra long life, this motor is designed and built to Automatic's rigid specifications *especially* for the Transporter.

DRIVE UNIT Highly efficient double reduction unit. Driving wheel mounted on large diameter Timken tapered roller bearings. Entire drive mechanism and control unit are combined into an integral unit on large diameter steering turntable which revolves easily on ball bearings.

DRIVE CONTROL Simplified contactor control system with constant torque controller mechanically interlocked with double position brake. Contactor design prevents "shorting" motor and battery.

CONSTRUCTION Main frame composed of deep sectioned steel members. Sturdy one piece formed steel lift platform or heavy formed steel pallet forked frames are all-welded reinforced construction.

ELECTRICAL WIRING No grounded circuits. Two wire system same as used on larger electric industrial trucks. Does not utilize the frame of the Transporter to complete the electrical circuit.

SAFETY Transporter carries Underwriters' Laboratory seal.

Yes, it's a fact! Automatic Electric Transporters give years and years of trouble-free material handling performance because they're *planned* to do that kind of a job.

In design, precision engineering, and built-for-stamina ruggedness, they STAND UP . . . for years and years. American industry will tell you this is so. Because they have been industry tested since 1942. Many do 'round the clock, never-failing 24-hour service.

Many exclusive features *found in no other material* handling truck, contribute to the remarkable material handling record thousands and thousands of Transporters have made . . . a record all the more astounding when you consider that **to our knowledge, no Transporter *has ever completely worn out!*

Its finger-tip control moves tons and tons of material at 50% to 75% savings over manual handling. Its low electric charging cost and minimum of moving parts to wear out, make Transporter industry's best value for your money. Investigate! Mail the coupon.

Remember: Only Automatic Makes the TRANSPORTER

Transporter — A PRODUCT OF AUTOMATIC — Lightens LIFE'S LOADS

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141 W. 87th St., Dept. C-5
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Send me complete facts and Free Catalog describing long-life Electric Transporter and how it can cut my handling costs 50% to 75%.

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By.....*Position*.....

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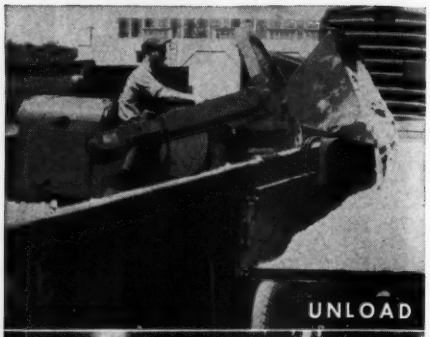
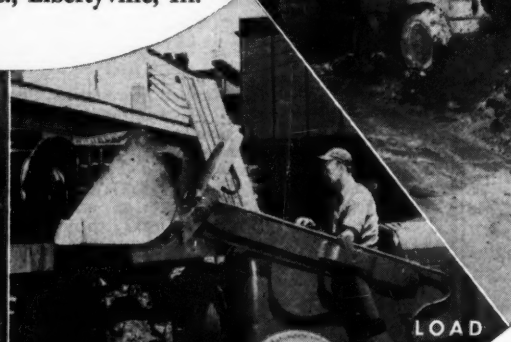
FOR THE *BULK* OF YOUR MATERIAL HANDLING

Payloaders are a proven, successful bulk-material-handling system at thousands of plants. They handle and rehandle all kinds of loose materials, small parts, bags, barrels and bales... eliminate many slow, laborious and costly operations... save time and labor... boost production.

Large pneumatic tires, short wheel bases and multiple speeds in both directions provide traction and maneuverability on or off hard floors, up ramps, through doorways and narrow aisles. It will pay *you* to find out how Payloaders can slash *your* material handling costs. See your Hough Distributor or write The Frank G. Hough Co., 731 Sunnyside Ave., Libertyville, Ill.





Send for catalogs on any size Payloader: the 12 cu. ft. Model HA; the ¾ yd. HF; the 1¼ yd. HL; the 1½ yd. HM. There is no obligation.

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PAYLOADER

Manufactured by THE FRANK G. HOUGH CO.

Flow

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VOL. 5, NO. 6 • MARCH, 1950

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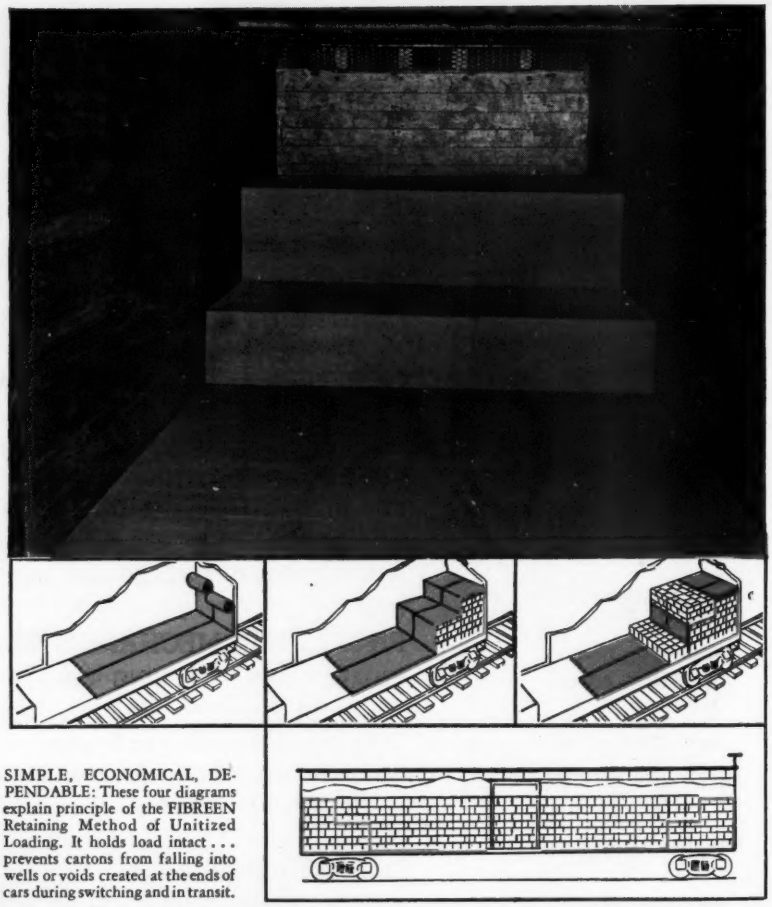
CLAIMS REDUCED 75% WITH FIBREEN UNITIZED LOADING

BIG FOOD SHIPPER REPORTS: "GRATIFYING RESULTS"

"On a movement of 108 cars (from Chicago to West Coast, Utah, Texas, Florida, Minnesota, New York and other areas north, east, west, and south), our records reveal that with FIBREEN protection, our damage prior to reconditioning averaged *less than* 3¼ *cases per car* . . . our claims have been reduced 75% since we adopted FIBREEN protection" . . . says the General Traffic Manager of one of America's foremost food canners. In some cars, loads had shifted 3" to 18" at the ends, but even then, the loads were intact . . . there was no tumbling of cartons into end-wells . . . the tough, non-stretching, waterproof FIBREEN proved strong enough to withstand the terrific strain and hold the loads.



SIMPLE, ECONOMICAL, DEPENDABLE: These four diagrams explain principle of the FIBREEN Retaining Method of Unitized Loading. It holds load intact . . . prevents cartons from falling into wells or voids created at the ends of cars during switching and in transit.

HERE'S PROOF! Not a Single Carton Dropped in Well

Photo shows one end of a car in which load had shifted about 10 inches. See how the FIBREEN held the load intact. No break in the retaining paper, no tumbling of cartons into end-well, no damage to cans. Reports from 92 consignees agreed on success of FIBREEN Method of Unitized Loading. Would you like to discuss your specific carloading problems with SISALKRAFT men experienced in this new method? Phone, wire or write: The SISALKRAFT Co., Chicago 6, Ill., New York 17, N. Y., San Francisco 5, Calif.

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Please send details on the FIBREEN Method of Unitized Loading, and sample of FIBREEN reinforced waterproof paper. We ship about.....cars per day.

Your Name.....

Firm Name.....

Street Address.....

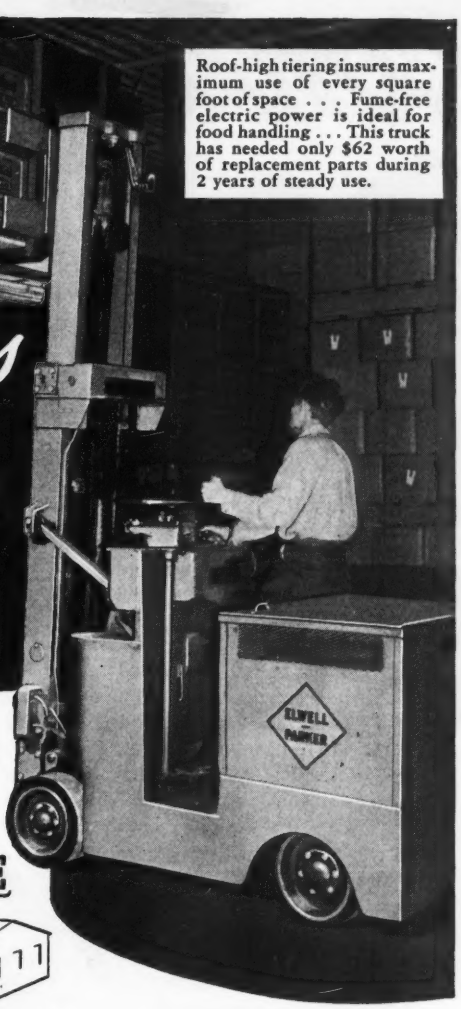
City, Zone and State.....

60% Saving in Man-Hours

made by this

ELWELL-PARKER!

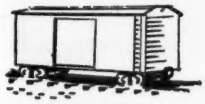
Here is a typical example of the big economies made by this E-P fork truck at the warehouse of a large grocery chain:



Roof-high tiering insures maximum use of every square foot of space . . . Fume-free electric power is ideal for food handling . . . This truck has needed only $62 worth of replacement parts during 2 years of steady use.

THE JOB . . .

Moving 2000 Cases of food from BOXCAR to storage in WAREHOUSE



PREVIOUSLY DONE BY . . .

8 MEN using 4-wheel TRUCKS

TOTAL MAN-HOURS REQUIRED 20

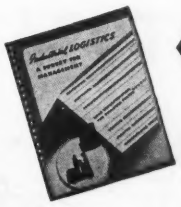
NOW DONE BY . . .

E-P TRUCK and 2 MEN

TOTAL MAN-HOURS REQUIRED 8

SAVINGS . . . 12 Man-Hours or 60%

Elwell-Parker trucks have developed notable *savings* in over 300 branches of industry during the past 44 years. To help you profit by this *unexcelled* materials handling experience, your near-by man is at your service. The Elwell-Parker Electric Co., 4233 St. Clair Avenue, Cleveland 3, Ohio.

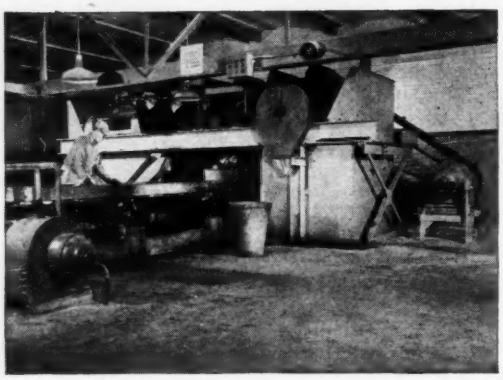


FREE BOOKLET on Scientific Materials Handling. Profusely illustrated. Ask for "Industrial Logistics" and name your product.

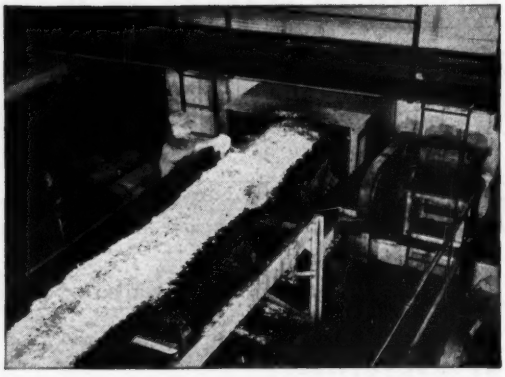
continuous flow

—a job for conveyors

1. This take-off conveyor in the American Crystal Sugar warehouse is driven by a 1-hp, totally-enclosed, non-ventilated, G-E Tri-Clad motor. The General Electric motor starting switch controlling the conveyor is located for easy operation by the attendant.



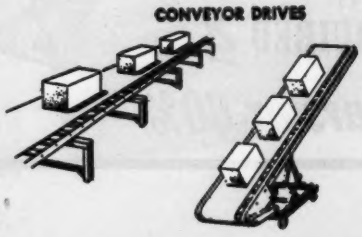
2. A bucket-type elevator transports beets from a wash house on the lower floor to the picking table shown here. A 15-hp, open (dripproof), G-E Tri-Clad motor chain-drives the elevator through a speed reducer while a 5-hp motor with speed reducer drives the beet-picking table.



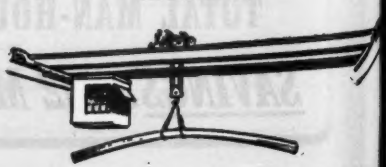
3. As they move along this belt conveyor, on their way from three G-E equipped slicing machines, sliced beets are continuously weighed before entering a continuous diffuser. The conveyor is chain-driven through a speed reducer by a Tri-Clad motor. The operator inspects the beets for quality.

Everything electrical for **MATERIALS HANDLING**

CONVEYOR DRIVES



CRANE DRIVES



at 2 tons a minute

POWERED by G.E.

Modern Sugar Factory Relies on G-E Conveyor Drives To Maintain High Production

At the American Crystal Sugar Company's modern plant at Moorehead, Minnesota, up to 800,000 pounds of sugar and 300,000 pounds of dried beet pulp are produced in a 24-hour day. Setting records like this meant avoiding lengthy breakdowns in conveyor lines. Faced with this tough materials handling problem, American Crystal standardized on General Electric equipment.

The results? Here's a typical one. Listen to the plant operators: "Our G-E Tri-Clad motors get a lot of water splashed on them and take a surprisingly large amount of dripping—but still go right on operating. When necessary, it's a simple job to interchange motors between conveyors."

Whether you plan a simple conveyor installation or an integrated handling system, it will pay you to specify G-E motors and control. The nearest G-E office is listed in your local classified telephone directory. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

4. A screw conveyor, 24 inches wide and 70 feet long, carries residue beet pulp from the diffuser to presses at 6000 cubic feet per hour (40 pounds per cubic foot). It is driven by a 20-hp, open, Tri-Clad motor. Tri-Clad dripproof-type construction makes the use of a special enclosure unnecessary.

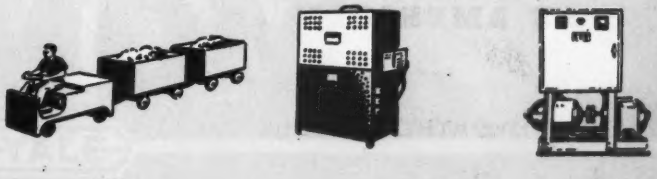
5. Tiering of bales in the warehouse is simplified by a special elevatoring system. Each elevator is equipped with two 3-hp, totally enclosed, non-ventilated, Tri-Clad motors. Use of this type of equipment makes possible the storage of up to 40,000,000 pounds of sugar and 5,000,000 pounds of plain pulp.

GENERAL ELECTRIC

668-79

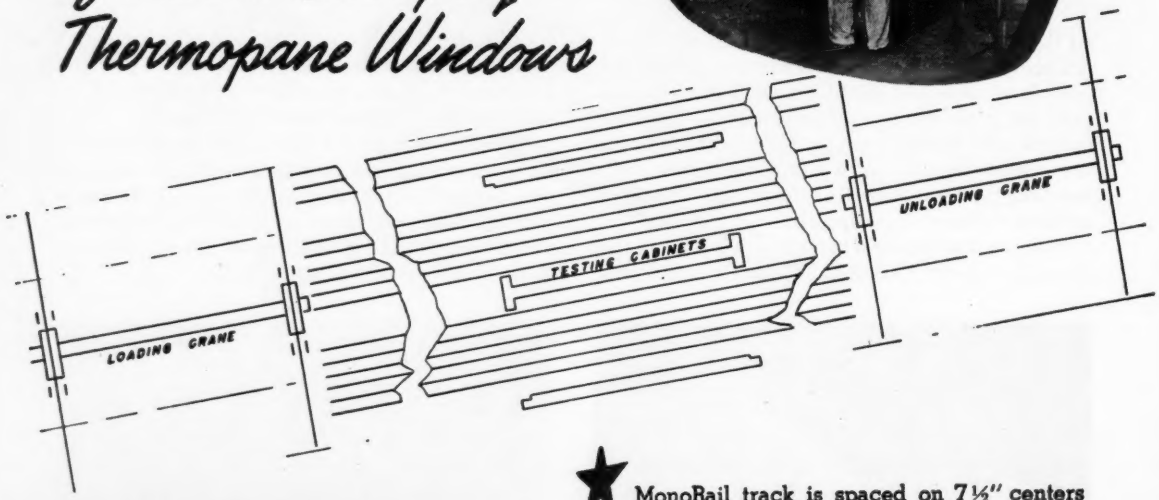
HOIST DRIVES

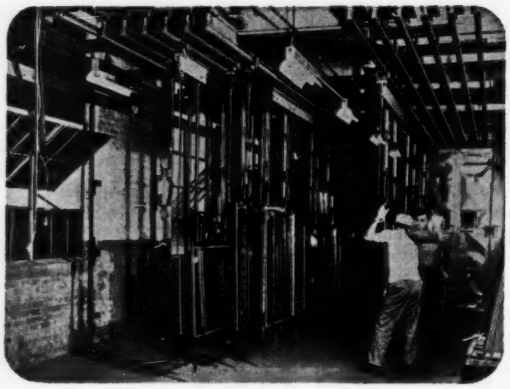
INDUSTRIAL TRUCK DRIVES & BATTERY CHARGERS



AMERICAN MONORAIL

Permits Close Spacing of Tracks Carrying Thermopane Windows





PHOTOS COURTESY
LIBBEY-OWENS-FORD GLASS CO.
TOLEDO, OHIO

★ MonoRail track is spaced on 7½" centers with interlock with cranes to permit 12 rows of Libbey-Owens-Ford Thermopane windows to enter testing cabinets. Empty carriers are transferred from MonoRail crane across interlock to loading track. From loading through testing cabinets, carriers travel a distance of 121 feet. Track interlocks with crane in unloading area—empty carrier is returned by gravity on three tracks. From the simplest hand-operated unit to the most complicated fully automatic system, American MonoRail engineers can suggest a system best suited to your problems that will save you money.

THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE **CLEVELAND 7, OHIO**

GIVING COSTS THE *economy treatment...*

The economy treatment—that's what handling costs are getting in more and more plants. It's high time, too, because it is estimated that unskilled workers still devote 80% of their time to moving materials. And when you also consider that at least 30c out of every production dollar is paid out to lift, transport and stack goods, you have plenty of reasons why the cost of material handling needs a good going over.

Thousands of large and small plants are already putting a big dent in handling costs by using Yale Hoists, Trucks and Scales. You can have the same economy now. Let us give you the benefit of our long and varied experience in solving material handling problems. Our recommended "economy treatment" will lead you to efficiency, speed, safety and lower costs. Phone or write today.

THE YALE & TOWNE MANUFACTURING COMPANY
Department L-105
Roosevelt Boulevard **Philadelphia 15, Pa**

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TOOLS THAT KEEP INDUSTRY "ON THE MOVE"

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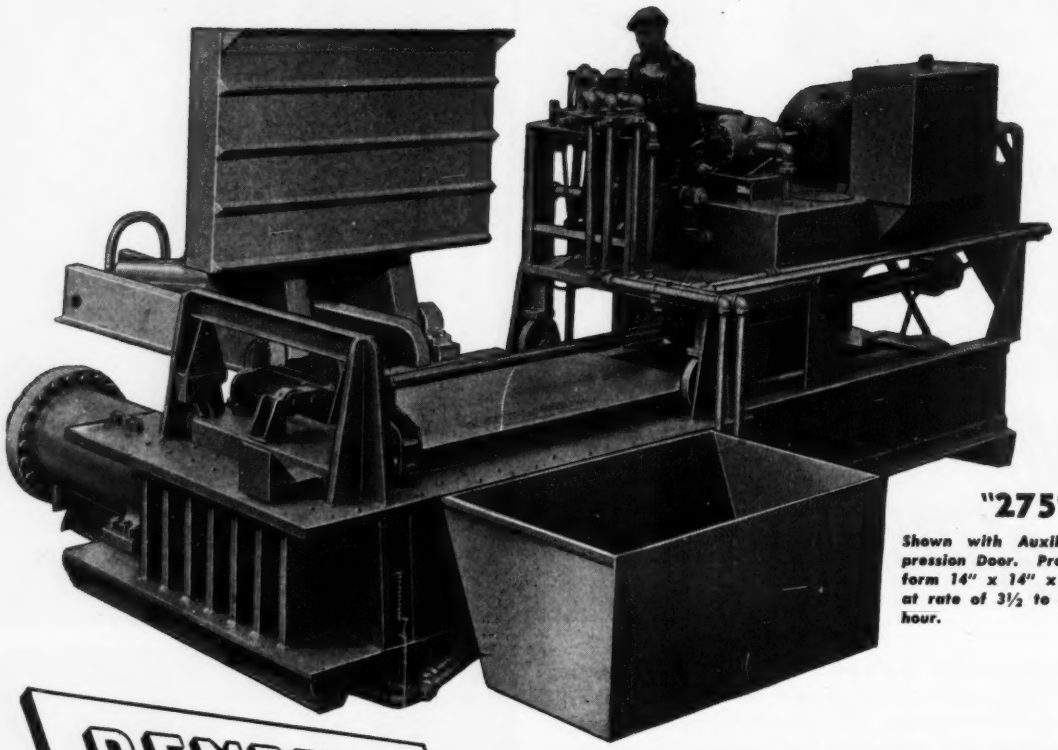
MATERIAL HANDLING MACHINERY · *hoists . . . hand and electric · trucks . . . hand lift and power · industrial dial scal*



"275"

Shown with Auxiliary Compression Door. Produces uniform 14" x 14" x 22" bales at rate of 3½ to 4 tons per hour.

DEMPSTER BALESTER

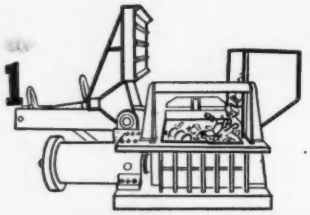
TRADE MARK REG.

High-Speed Presses Boost Scrap Metal Handling Profits

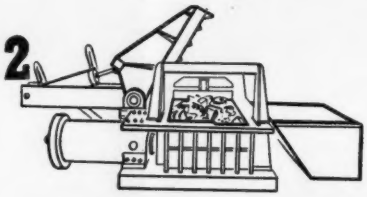
The high-speed 275 Dempster-Balester, producing bales at the rate of 3½ to 4 tons per hour, is making scrap metal handling more profitable than ever before. With its simple construction and two ram design, the machine is easy to install . . . economical to operate. The hydraulically operated Auxiliary Compression Door compresses heaped scrap into the charging box with a 45 ton force. Users report a conservative 25% increase in production . . . with a baling crew of only two men . . . plus faster, more economical operation with the compression door. The hydraulically actuated Skip-Pan Loader, another cost-cutter, is standard equipment on all models. This invaluable feature permits preparation of a new full charge while press is baling. Illustrated below is the 1-2-3 production punch of a Dempster-Balester with Auxiliary Compression Door and Skip-Pan Loader. Write today to J. G. Walden for completely illustrated folders on the Dempster-Balesters, Models 275, 600 and 128. All products of Dempster Brothers, Inc.

The "600"

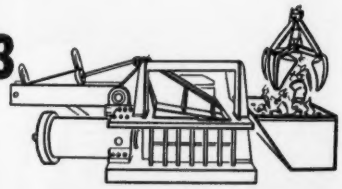
The Dempster-Balester "600" is a top production machine. It turns out scrap metal bales at the rate of 6 to 7½ tons per hour. It produces a uniform high density bale that measures approximately 16 inches by 18 inches by 35 inches, ranging in weight from 600 to 1,000 lbs. each.



Skip-Pan Loader dumps scrap metal into charging box. Auxiliary Compression Door is in "up" position ready for immediate action once operator touches hydraulic controls.



Skip-Pan returns to loading position as Auxiliary Compression Door begins its "one stroke" compressing operation.

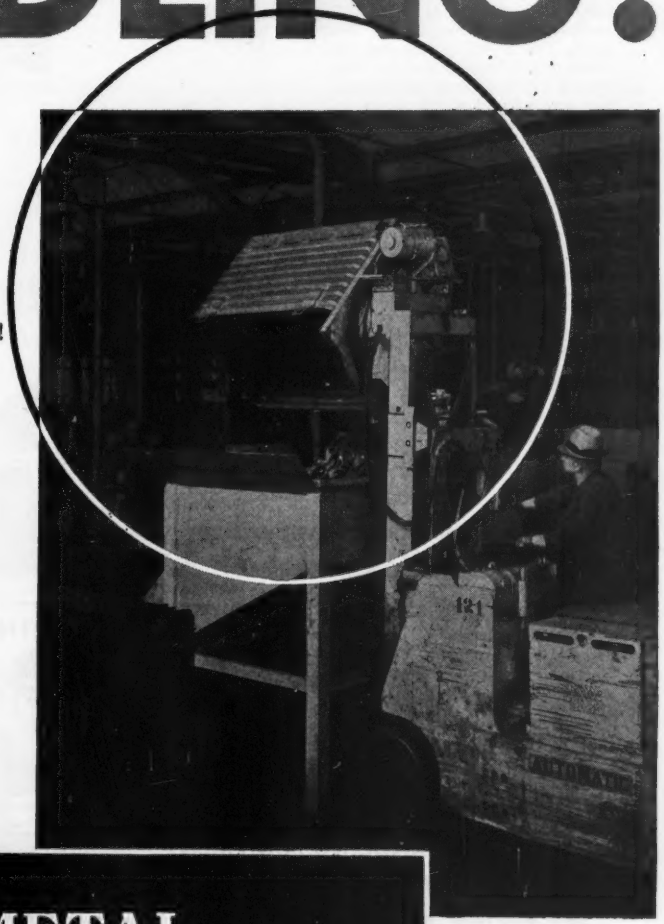


Door compresses scrap, permitting charging box door to be closed without further arranging. During baling cycle Skip-Pan is reloaded and charge dumped into box as soon as bale is ejected.

DEMPSTER BROTHERS, 830 N. Knox, Knoxville 17, Tenn.

MATERIALS HANDLING EQUIPMENT

DESIGNED FOR LESS HANDLING!



WHEN you can take shortcuts in materials handling, resulting in *less* handling, you save time and money.

For example, the sturdy Union Metal dump box shown here fights waste motion! Its roll-over feature assures fast, easy, safe dumping. Four-way entry permits the fork truck to pick up the load from *any* side—an obvious convenience and time-saver. Finally, the box is also equipped for crane handling, for short operational spotting with a hand pallet truck, and for fast, compact tiering.

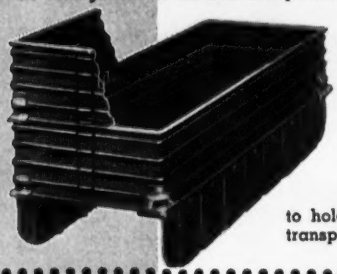
This is just one of the many different types of Union Metal boxes, skids, pallets and combinations . . . all engineered for efficient materials handling at its best. Write The Union Metal Manufacturing Company, Canton 5, Ohio, about equipment ideal for *your* needs.

UNION METAL
Materials Handling Equipment

POWELL Boxes and Box Platform Units CUT Your Materials Handling Costs

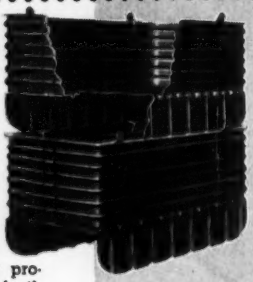
REMOVABLE OR DETACHABLE STANDARD TIERING BOX

A sectional welded box with heavy corrugated corner lugs of special design. Lugs are welded and conform to the corrugations of the box. Box permits increased capacity of platform. Sections can be added or removed as job demands. For shipping, corner lugs can be furnished with holes so that by drilling boxes and platform, boxes can be bolted together to hold units rigid during transportation.



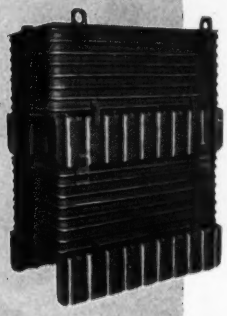
TIERING WELDED BOXES PLATFORM

A welded box platform equipped with POWELL tie ing lugs. This special lug allows the use of full size boxes, without losing container cubical capacity. The units can be tiered, one upon another, to any height desired. The POWELL tier lug provides ample bearing surface, facilitating stacking. Lugs are securely arc welded and so arranged that the load stress is carried vertically by sides of boxes and platform.



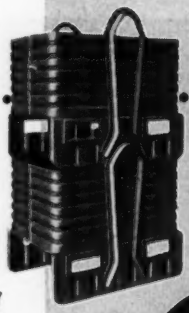
CRANE TIERING WELDED BOX PLATFORM

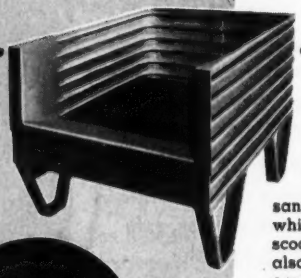
Welded box platform equipped with short crane lugs. Box is welded to platform using standard 3" of weld per lineal foot. Note additional tie lugs welded to box and platform as a further factor of security. This unit can be tiered where space saving is essential.



FOUR-WAY FORK HANDLING UNIT

Maximum strength all-steel stacking units built to provide for four-way operation. These units are examples of POWELL versatility in engineering, designing, and building special purpose materials handling equipment for particular applications.

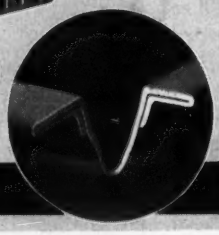




FOUNDRY FUNNEL BOX

Rugged all-steel multi-purpose box for use in foundries, smelting plants and similar industry. Open front allows access to sand, castings, and like materials which are handworked with shovel, scoop or fork implements. Unit can also be used for mechanical dump operation.

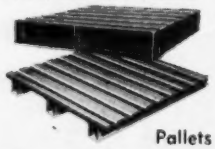
POWELL builds all types of materials handling equipment for any industry. POWELL can cut your materials handling costs—whatever your operation may be.



ADDED STRENGTH in POWELL DESIGN

POWELL ALSO MAKES COMPLETE LINES OF STANDARD & SPECIAL

Tote Pans



Pallets

Hopper Boxes

Dump Boxes

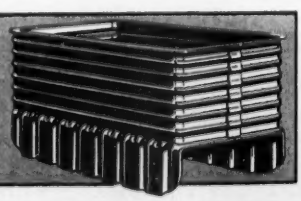
Collapsible Containers

Mesh Containers

ORIGINATORS OF COLD FORMED ALL-STEEL HANDLING EQUIPMENT

POWELL

PRESSED STEEL



Send Inquiries to: Dept. 23
HUBBARD, OHIO

To FLOW:

For National Lumber Group

The FLOW DIRECTORY of Material Handling Equipment, Machinery and Accessories, which your office so generously mailed to the members of the Committee on Materials Handling of the National Retail Lumber Dealers Association, has proved to be most helpful in this work, which includes the advising of lumber dealers the names and addresses of firms in his vicinity who may be able to assist him in his material handling problems.

In order that the Association may have the proper information and reference guides in their files, we would appreciate your sending a copy of the FLOW DIRECTORY, and the regular monthly mailing of the FLOW Magazine, to the National Retail Lumber Dealers Association, Washington, D. C. — James F. Mack, Chairman, Materials Handling Committee, Mack Lumber Company, Hollywood, Fla.

FLOW has been cooperating regularly with a number of national groups, and it is glad to extend the same cooperation to the country's retail lumber dealers.—Ed.

To FLOW:

The DIRECTORY

Thank you for a copy of the FLOW DIRECTORY of Material Handling Equipment. We wish to compliment you on a well gotten up publication. This information will be of valuable assistance to us in answering inquiries from wholesale grocers who are making plans to modernize or improve their materials handling operation.—Harold O. Smith, Jr., Executive Vice-President, United States

SAVE MONEY

SAVE
Floor Space
Ceiling Space
Storage Space
Storage Time
Receiving Time
Production Time
Maintenance Time
Shipping Time

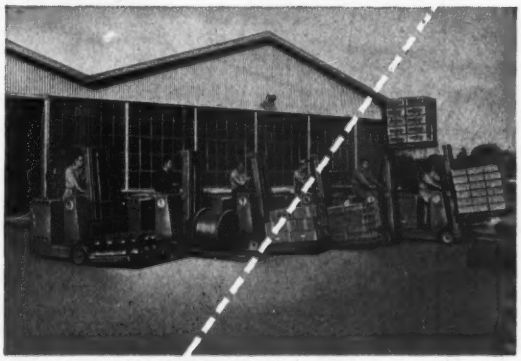
MULTIPLY MANPOWER • LEWIS-SHEPARD ®

CUT COSTS WITH The "MASTER" Line

SPACEMASTER Electric Trucks
SPACEMASTER Gas Trucks (Fork Types)
MASTER JACKSTACKERS
JACKLIFT ELECTRIC Trucks
MASTER JACKTRACTORS
MASTER JACKLIFT Trucks
MASTER QUICKLIFT Trucks
MASTER REDILIFT Trucks
MASTER SPEEDLIFT Trucks
POWERMASTER Stackers
FLOORMASTER Trucks
SHIPMASTER (All-Steel 2-Wheel) Trucks
WELDMASTER Platforms
LOADMASTER Racks

WRITE FOR BULLETIN NO. 25

The "MASTER" ® Line,
MATERIALS HANDLING EQUIPMENT
"Engineered to Save You Money"



Smart fleet of "SPACEMASTER" Electric Fork Trucks handle many kinds of materials in this public utility warehouse.

"SPACEMASTER" Electrics operate quicker, in less space. "SPACEMASTER" Electrics have low cost maintenance, less down time. "Standrive" feature lets operator pivot and turn and thus safely trail load. No need to turn truck and load around as his vision is unobstructed. Better visibility also permits accurate placement of forks and spotting of loads . . . "Deadman" brake; greater stability; plus free, quick access from either side give greater SAFETY . . . Send For Bulletin 25 Today!

Multiply Your Manpower with The "MASTER" Line

Tap this new source of profit!

LEWIS-SHEPARD
PRODUCTS INC.
115 WALNUT STREET, WATERTOWN 72, MASS.
Midwest Plant: Crawfordsville, Ind.
REPRESENTATIVES IN PRINCIPAL CITIES

PACKAGING TIME CUT 50%

PACKAGING COSTS CUT 60%

Read how this manufacturer makes big savings with STANLEY STEEL STRAPPING

You know that waste of time, labor and money packaging any product can cut deep into over-all profits. This typical case history shows just how big a saving the Stanley Steel Strapping System can make.

The Keystone Metal Moulding Company of East Detroit, Michigan, cut packaging time 50% by change from small cartons to large carton on a skid. New carton is closed, reinforced and bound to the skid with Stanley Steel Strapping. Packaging costs reduced a full 60%.

Figures like these from manufacturer after manufacturer who has switched to the Stanley Steel Strapping System tell a story you can't afford to ignore. Whatever your product — no matter how big or how small — check on the savings Stanley Steel Strapping can make in *your* Shipping Room.

Write for full details or have a Stanley representative call now. The Stanley Works, Steel Strapping Division, 203 Lake Street, New Britain, Connecticut.

STANLEY

Reg. U.S. Pat. Off.

STEEL STRAPPING AND CAR BANDING SYSTEMS

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

Wholesale Grocers' Association, Inc., Washington, D. C.

To FLOW:

Letters Bring Letters

I noticed in the December issue, in "Over The Editor's Shoulder," an article on bagged materials. You mentioned that FLOW has periodically featured bag-handling operations which involve such divergent materials as coffee beans, etc.

I would be very interested in obtaining any issues or information which you have published or have available pertaining to bag-handling operations for coffee beans.—Robert Cohn, Continental Coffee Co., Toledo, Ohio.

These were sent. Handling operations involving two different types of bagged materials were described in reports in the January and February issues.—Ed.

To FLOW:

Meters For Cost Analysis

We should appreciate very much any information you could give us concerning the names and addresses of manufacturers of current use meters, gasoline consumption meters, engine hour meters or other instruments or devices used for checking or measuring performance or activity of various types of materials handling equipment.

This information is desired in connection with certain materials handling equipment cost studies, on which this Branch is engaged, involving the handling of different kinds of agricultural commodities in various types of marketing facilities.—J. B. Wilmeth, Marketing & Facilities Research Branch, United States Department Of Agriculture, Washington, D. C.

To FLOW:

Ice For Israel

We refer to the paper "Pallet Loader In A Filling Line", by M. S. Imes, Terminal Superintendent, Union Oil Co. of California, printed

(Turn to page 18)

P&S

Materials HANDLING EQUIPMENT

CUSTOM BUILT TO MEET YOUR NEEDS

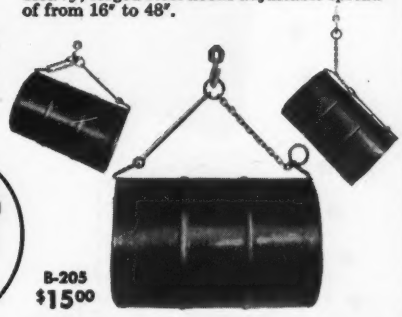
Designed to do Specific Jobs Better

Item J-631 (1000 lbs) $28.90

Item J-632 (1 Ton) $35.55

UNIVERSAL GRAB

For picking up heavy boxes, crates, bales or other loads where hooks may be used. Heavy, forged steel hooks adjustable spread of from 16" to 48".



B-205 $15.00

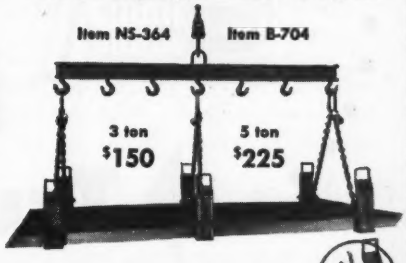
DRUM *and* BARREL SLING

Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Wt. 8½ lbs.

Item B-731 $165.00

DRUM *and* BARREL TILT

A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive. Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.

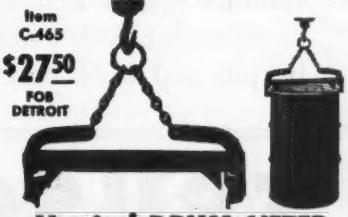


SHEET STEEL GRAB

Handles sheet steel bundles, any size 0" to 9" thick, 18" to 48" wide and any length.

BARREL *and* BOX GRAB

For picking up any type of wood or steel barrel, box or container, from 40" diameter down to small nail keg size. Will lift up to 2000 lbs.



***Vertical* DRUM LIFTER**

For handling open and closed steel drums in vertical position, by crane or hoist. All-steel, with heavily welded chain. Sure-hold safety barrel grip. Saves plant space. Use for either high or low ceiling condition.

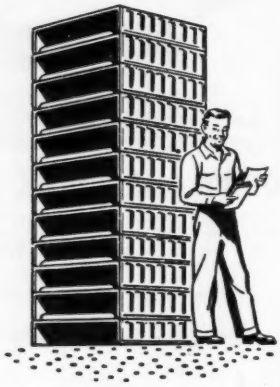
When ordering please give item number. Prices subject to change without notice.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16012 Fullerton Avenue, DETROIT 27, MICHIGAN

SAVE SPACE!



Pile Many in Small Space!...

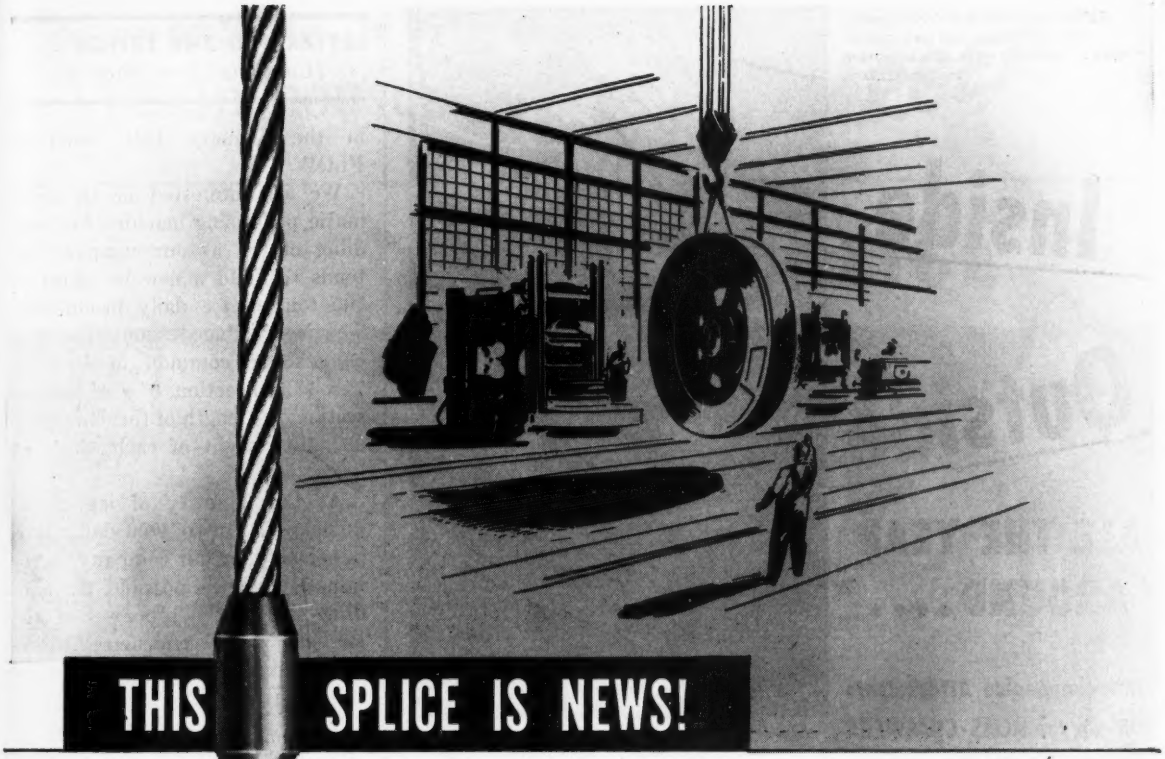
Showing the new Truscon Collapsible Steel Box with three sides fully up and fourth side almost completely in place.

New Collapsible Truscon Steel Box

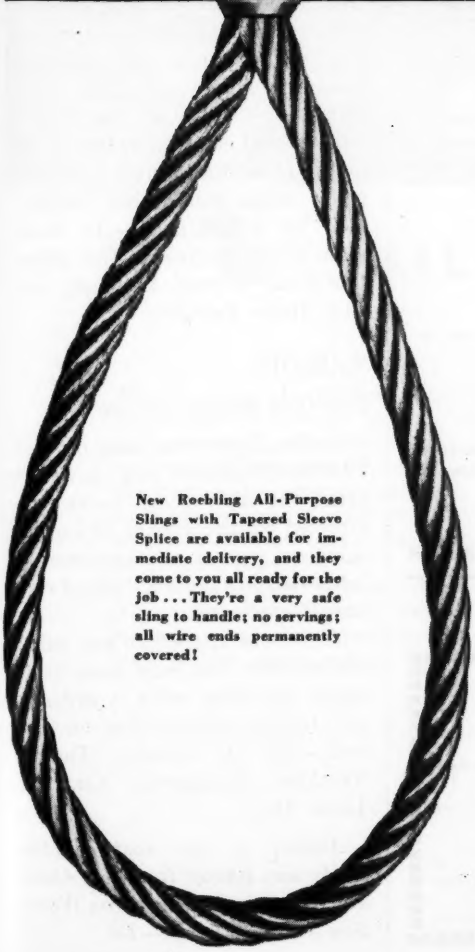
Save space...get more efficiency in your plant...with this unusual new Truscon Steel box design! It can be knocked down or set up in a moment. Handles equally well with platform or fork truck; can also be equipped for crane or industrial truck handling. When in upright position, collapsible sides are locked by pin and slide bolt arrangement. Available in various widths, lengths, heights. Can be tiered when loaded or empty, to help greatly reduce unproductive floor areas. Write for details.

FREE BOOK! *Describes complete line of Truscon Steel Boxes and Skids for materials handling. Shows wide range of models to meet any requirements you have. Write for your free copy.*

TRUSCON STEEL COMPANY
PRESSED STEEL DIVISION
6100 TRUSCON AVENUE • CLEVELAND 4, OHIO
SUBSIDIARY OF REPUBLIC STEEL CORPORATION



THIS SPLICE IS NEWS!



New Roebling All-Purpose Slings with Tapered Sleeve Splice are available for immediate delivery, and they come to you all ready for the job . . . They're a very safe sling to handle; no servings; all wire ends permanently covered!

New Roebling All-Purpose Sling with the Tapered Sleeve Splice

YOU GET NEW SAFETY at less cost with this unique splice. It's cheaper than ordinary tucked splices . . . saves the expense of "splicing your own." This remarkably simple rolled loop and tapered sleeve attachment develop the *full catalog strength* of the new Roebling All-Purpose Sling.

New Roebling All-Purpose Slings with the Tapered Sleeve Splice are made of Preformed "Blue Center" Steel Wire Rope with Independent Wire Rope Core. Their rolled loops are made by passing three strands and the core around the loop in one direction, and the other three strands in the opposite direction. Ends of all wires are permanently anchored in the compact, tapered sleeve.

Roebling All-Purpose Slings are the last word in toughness and dependability . . . offer full flexibility and handling ease. They are available in all standard lengths and sizes. Write for fully descriptive folder . . . and for the "Sling Data Book." In the full Roebling line there's a safe sling for top performance and dollar savings on every lifting job. ***THAT'S WHY***

Today it's Roebling!

JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, NEW JERSEY

ROEBLING *A CENTURY OF CONFIDENCE*

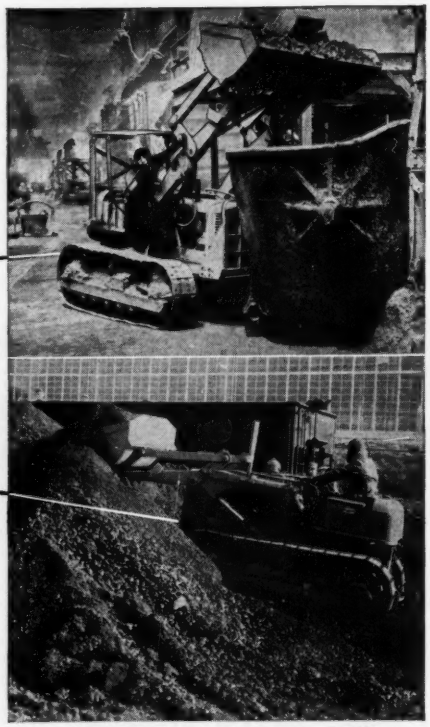
Atlanta, 934 Avon Ave. ★ *Boston,* 51 Sleeper St. ★ *Chicago,* 5525 W. Roosevelt Road ★ *Cincinnati,* 3253 Fredonia Ave. ★ *Cleveland,* 701 St. Clair Ave., N. E. ★ *Denver,* 4801 Jackson St. ★ *Houston,* 6216 Navigation Blvd. ★ *Los Angeles,* 216 S. Alameda St. ★ *New York,* 19 Rector St. ★ *Philadelphia,* 12 S. Twelfth St. ★ *Portland,* 1932 N. W. 14th Ave. ★ *San Francisco,* 1740 Seventeenth St. ★ *Seattle,* 900 First Ave. S.

Lifting and loading materials, parts, etc. . . . clean-up and maintenance work . . . drawbar work such as moving machinery, cars.

Inside Outside

ALL THE YEAR AROUND . . . .

Interchangeable Attachments Make the* ALLIS-CHALMERS HD-5G and TRACTO-SHOVEL *a Versatile, Money Saving, All-Season Producer



Maintaining grounds and parking areas . . . bulldozer work . . . excavation . . . snow removal . . . load and unload bulk . . . stockpiling . . . spotting cars.

Here is a material handling outfit that can't be beat on many jobs, either inside or outside of industrial plants. Handling bulk . . . stockpiling . . . feeding hoppers . . . plus dozens of dozer and bucket jobs make the HD-5G Diesel Tractor with Tracto-Shovel an invaluable, ever-busy investment in speeding up your operation, cutting down your costs.

Allis-Chalmers builds a wide line of wheel and crawler tractors for material handling of all kinds — loading, carrying, pulling.

ATTACHMENTS

1 cu. yd. Standard Bucket
¾ cu. yd. Narrow Bucket
2 cu. yd. Light Materials Bucket
1 cu. yd. Rock Bucket
Drag Bucket
Teeth For All Buckets
Bulldozer Blade
Angledozer Blade
V-Type Snowplow
Tine Fork
Rock Fork
Lift Fork (for pallets)
Crane Hook
Back Hoe

• • •

Tractor weight with Tracto-Shovel 16,200 lb., 40.26 drawbar hp., 50.25 belt hp.

SEE YOUR **ALLIS-CHALMERS** DEALER

or Send Coupon for Literature

ALLIS-CHALMERS TRACTOR DIVISION, Dept. F, Milwaukee 1, Wisconsin

Please send information on the Allis-Chalmers HD-5G Tractor and Tracto-Shovel.....; rubber-tired Tractor-Loader.....; IB Industrial Wheel Tractor..... with these attachments: crane....., sweeper....., snowplow....., winch.....

Name.....

Company.....

Street..... City..... State.....

LETTERS TO THE EDITOR . . .

(Continued from page 14)

in the January 1949 issue of FLOW.

We are interested in an automatic palletizing machine for handling of ice, as our company intends to build a new ice plant of 100 tons of ice daily production. The ice produced should be of a cone shape common in Europe: 7″ x 7″ top section, 6″ x 6″ bottom section, the length of the cone to be 38″, the weight of each block 25 kgs.

As the quantity of ice blocks pulled will run to 4000 daily, it is imperative for our company to eliminate, as far as possible, the handling during the processes of the ice being pulled, transferred to the lorries, transferred into and from the ice store.

While certain operations can be done very efficiently with conveyors, the stacking of the ice in the store and the removal of the ice from the stacks would be most efficiently done by the aid of palletizing and assembling 25 or 30 blocks of ice into a unit load on a pallet which would then be handled by a fork-truck.—D. Feldman, Chief Engineer, The Palestine Cold Storage & Supply Co. Ltd., Haifa, Palestine.

To FLOW:

Low-Cost Shingle Storage

In the September issue of your FLOW Magazine you have an article on the special racks constructed for the storage of asphalt shingles. One of our customers is interested in the same type of rack for his application.

We would appreciate any information that you may have as to whom we could write in order to get further information on this rack.—M. A. Perrier, Factory Trucking Equipment Co., St. Louis, Mo.

Author of this cost-reduction study was Baxter R. Grier, Assistant Supervisor, Alamo Iron Works, San Antonio, Texas.—Ed.

YOU CAN BE **SURE**.. IF IT'S

Westinghouse

LOCAL CHARGER SERVICE

ALL OVER THE MAP

. . . Yet at your door

Always there—if needed—Westinghouse Rectox Battery Charger Service. The scope is nationwide; yet service is local. 38 fully equipped Westinghouse Repair Plants serve the emergency needs of users and electric truck representatives. This means immediate service . . . fast answers to problems . . . no production delays.

Further, Rectox Battery Chargers save power. Reactors eliminate energy wasting resistors. Simple dials control operation from high to low range and no taps to adjust.

Rectox have proved their dependability over a 20-year period. Just plug them in and forget them. Complete facts are available from your local Westinghouse representative. Ask him for a copy of Descriptive Bulletins, DB-19-040 and 19-045, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-21569

WESTINGHOUSE

Rectox

You can speed your entire handling operation with the tote boxes they're making of Alcoa Aluminum. Strong as steel ones at half the weight, aluminum tote boxes handle easier—stack easier. Steam cleaning can't hurt them. Neither does vapor or solvent degreasing. Manufacturers in radio and electronics industries like their non-magnetic property. Others use them because they won't spark—or won't mark with red rust. Their low cost will surprise you.

We'll gladly send you a complete list of manufacturers making these better, lighter tote boxes. Just mail the attached coupon to: ALUMINUM COMPANY OF AMERICA, 1985C Gulf Building, Pittsburgh, 19, Pennsylvania.

LIGHT WEIGHT

NON-MAGNETIC

CAN BE STEAM CLEANED OR DEGREASED

Gentlemen:

Please send a complete list of manufacturers who are making tote boxes of Alcoa Aluminum.

Name_____

Title_____

Company_____

Address_____

ALCOA ALUMINUM

ALCOA

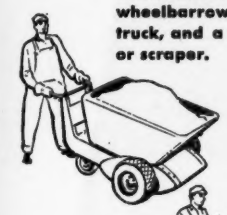
FIRST IN ALUMINUM

• • •

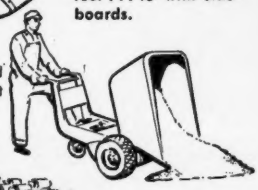
A 15-minute demonstration will show you how to

SAVE UP TO 20 MAN-HOURS A DAY

You can make these savings with the BELL Prime Mover . . . a new conception in materials handling, plant-maintenance equipment, and all around utility . . . a machine that combines the functions of a giant self-propelled wheelbarrow, a half-ton platform truck, and a powerful snow plow or scraper.



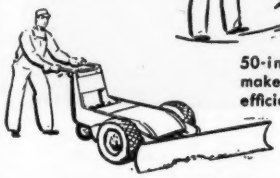
Bucket holds 10 cubic feet . . . 18 with sideboards.



Mechanically dumped . . . operates by foot pedal.

9-square-foot steel platform takes half-ton loads.

Climbs 20% grades fully loaded.



50-inch steel blade makes Prime Mover an efficient snow plow.

The BELL Prime Mover*

FEATURES:

- gear driven . . . no belts or chains
- fully enclosed engine protected against dirt and moisture
- clutch, engine, transmission all run in oil
- switch from bucket to platform without tools . . . in less than a minute
- turns in its own length (63½"); width 31½"
- 3-gallon tankful of fuel gives 8 hours continuous service

A PRODUCT OF BELL *Aircraft* CORPORATION

*PATENTS & T. M. REG. PENDING. COPYRIGHT, 1949

● Hundreds of plants now use one or more Bell Prime Movers to haul bulk materials to and from processing stations and to relieve workmen of heavy lifting and pushing. These plants report savings in payroll as high as $36.00 a day for each Prime Mover.

Not only do Prime Movers speed production and cut costs, they also contribute to morale. For example, a tannery purchased its Prime Mover simply to make a disagreeable and heavy job easier for workmen. Another plant bought a machine so as to utilize the services of an elderly worker no longer able to do heavy labor.

Wherever wheelbarrows or hand trucks are used in your plant, the Prime Mover should be carefully considered. Not only will it perform this work better and at lower cost, but it can be shifted to other duties . . . plowing snow, grading driveways, hauling construction materials or maintenance equipment. Its versatility and usefulness in and about a plant are virtually unlimited . . . but see this for yourself at a demonstration.

Simply sign the coupon and clip it to your letterhead. We'll put you in touch with a nearby distributor . . . a member of our nationwide sales and service organization.

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BELL AIRCRAFT CORPORATION, P. O. Box 1L3, Buffalo 5, N. Y.

Please send me facts on the Bell Prime Mover. Who is the nearest distributor?

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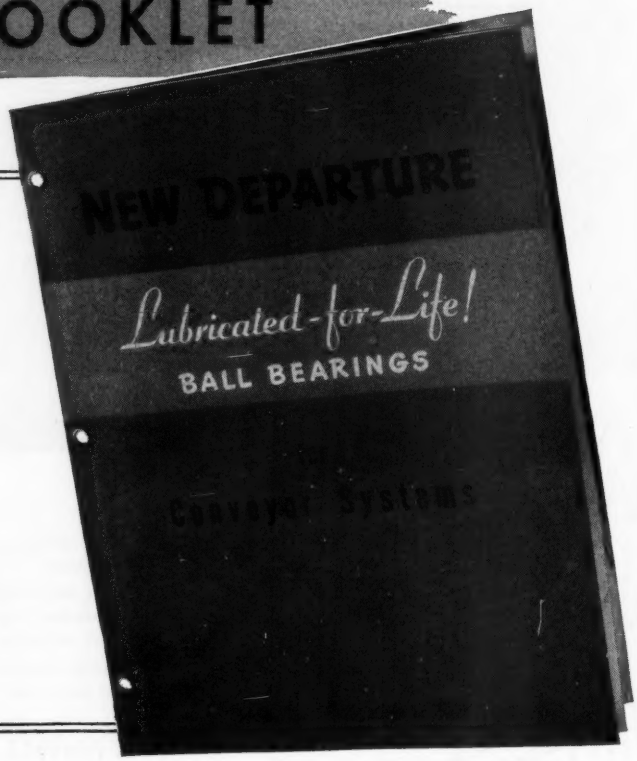


MORE THAN any other single invention perhaps, the mechanized conveyor system lifts the load off man's back and puts it on the machine.

It is a typically American invention, and it represents a typically American way of getting things done.

By originating and developing ball bearings which are lubricated-for-life and are sealed to keep dirt out, New Departure made a contribution of major importance to the modern conveyor system.

Proved in installations operating under rugged conditions, in temperatures from below zero to desert heat, and exposed to dust and dirt . . . carriers developed around these lubricated-for-life conveyor bearings are giving years of service without any cost for greasing.

The story of New Departure Conveyor Bearings and the services that go with them is told in a new booklet, illustrated above.

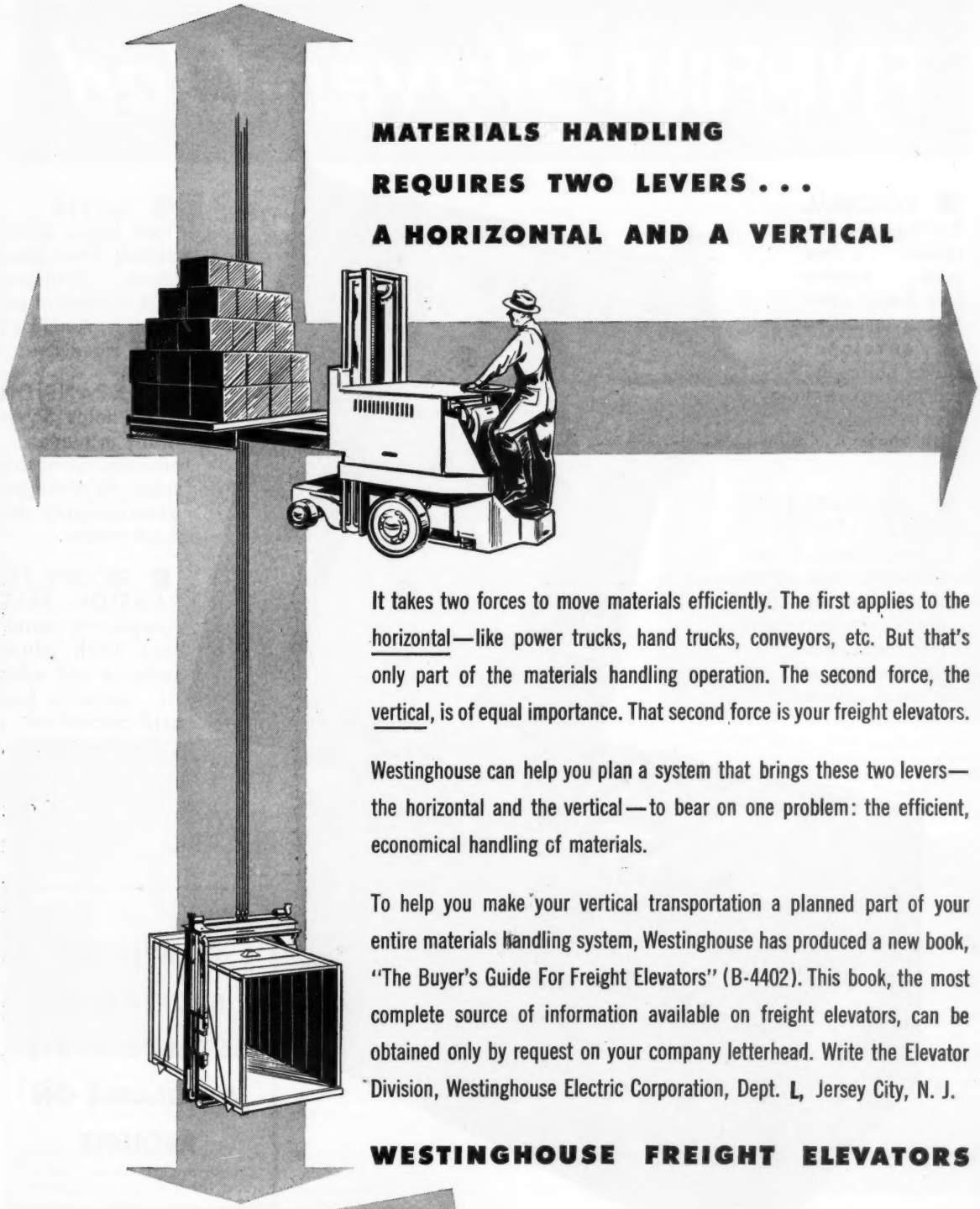
If you design or manufacture or use conveyor systems, you will find it interesting and helpful reading. Mailed promptly, to requests on business letterheads. Write Dept. CF.

Nothing Rolls Like a Ball . . .

NEW DEPARTURE
BALL BEARINGS

90

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT



MATERIALS HANDLING REQUIRES TWO LEVERS . . . A HORIZONTAL AND A VERTICAL

It takes two forces to move materials efficiently. The first applies to the horizontal—like power trucks, hand trucks, conveyors, etc. But that's only part of the materials handling operation. The second force, the vertical, is of equal importance. That second force is your freight elevators.

Westinghouse can help you plan a system that brings these two levers—the horizontal and the vertical—to bear on one problem: the efficient, economical handling of materials.

To help you make your vertical transportation a planned part of your entire materials handling system, Westinghouse has produced a new book, "The Buyer's Guide For Freight Elevators" (B-4402). This book, the most complete source of information available on freight elevators, can be obtained only by request on your company letterhead. Write the Elevator Division, Westinghouse Electric Corporation, Dept. L, Jersey City, N. J.

WESTINGHOUSE FREIGHT ELEVATORS

YOU CAN BE SURE... IF IT'S Westinghouse

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FIVE-FOLD Slyver-Clad

● **KOROSEAL** Perforated Retainer . . . two used . . . bottom grid frame completely insulated . . . envelopes entire plate and presses against Slyver and two glass mats..

● **MICROPOROUS RUBBER SEPARATOR** . . . impervious to heat, electrolyte and oxidation . . . close spaced for uniform pressure against Slyver-clad plates . . . high porosity and low electrical resistance.

● **SLYVER** . . . thick layers of infinitely fine glass fibres . . . laid parallel in vertical position . . America's BEST retention.

● **EXPANSION MAT** holds Slyver firmly in place . . . provides expansion space to eliminate unnecessary element strains.

● **SECOND EXPANSION MAT** completely envelopes both plate surfaces and sides . . . permits free acid circulation . . a third insulator.

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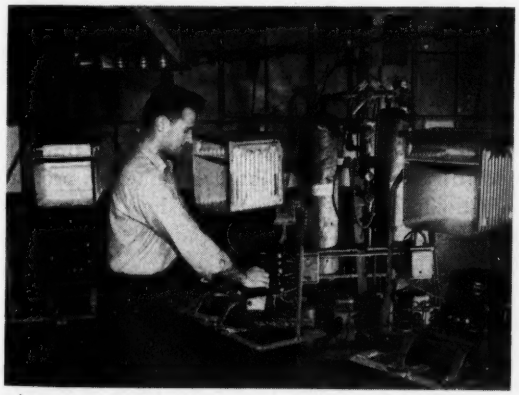
Established 1906 **of Conshohocken, Pa.** SALES AND SERVICE IN PRINCIPAL CITIES

Redesigned For Simplified Handling

The data for this photo report were contributed by
JOSEPH C. KRUGER,
Manager, Plant Layout and Processing,
Kelvinator Division of the Nash-Kelvinator Corp., Detroit

SIMPLIFIED product design eliminated special-purpose carriers at the Kelvinator Division of the Nash-Kelvinator Corporation, Detroit, which in turn simplified handling procedures and reduced maintenance work. From a product engineering standpoint, it became desirable to supplant the former fin-type condenser system with a stack-type condenser. The fin type unit required a conveyor carrier of fairly complex design, shown in two photos below, which was subject to bending and breaking. For shipment, this carrier was slid into tierable frames stacked three high in cars. These also required excessive repair work. The frames had to be light in order to keep dunnage costs down, and so did not have the necessary structural strength. Complete condensers are shipped from the company's Detroit plant to its Grand Rapids plant, where the systems are assembled to domestic refrigerators. On the same shuttle run, Grand Rapids sends evaporators to Detroit for assembly to the systems. The tendency of the shipping frames to warp also caused difficulty in Grand Rapids. Since the condenser systems were painted while on the conveyor carriers, jamming resulted (because of small clearances), which in turn sometimes necessitated "hammering out". Today, specially equipped box cars are used in the Detroit-Grand Rapids shuttle run in conjunction with the new stack type condenser. The photo series on these pages shows the old and the new handling methods.

OLD OPERATION—



1 OLD-TYPE T-and-angle-iron adapter (above) carried fin type condenser (A) through assembly, painting. Design of carrier entailed too much maintenance. Reason was that...

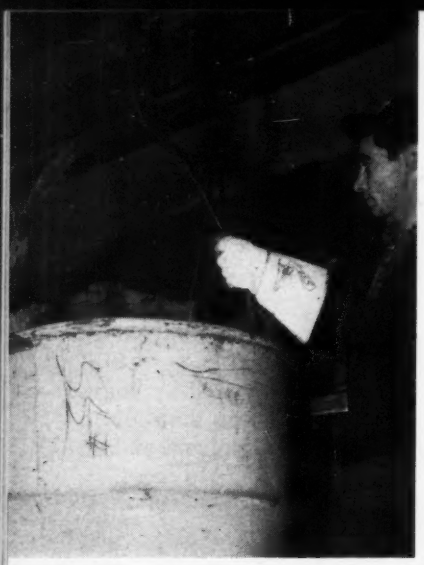
2 SHIPPING FRAMES, formerly used (below), held six condenser systems in grooved rails. Warping and bending caused time loss, extra maintenance. Now compare the...

NEW OPERATION—

3 ▲ NEW STACK TYPE condenser (A) which hangs on simple hook; evaporator hangs over it. Assembled systems are sent in specially equipped cars to Grand Rapids, which ships evaporators to Detroit. Below is the...

4 ▶ END OF ASSEMBLY line. Systems are shunted from delivering conveyor (rear) on gravity rollers to specially equipped rail car. Details on the latter are given in the next photo which shows the...

5 ▶ INTERIOR OF CAR. Units are made fast in specially constructed racks. Average car loading time 2 hrs. Simplified product design has simplified work carriers, handling, and reduced maintenance.



BRIDGE CRANE of 2000 lb. capacity lifts drums of blanks from delivery truck, and tiers.

FORK TRUCK loads baled scrap (on steel skid) on outbound vehicle, also delivers blanks.

A "different" kind of operation... done with standard handling tools

By W. D. ACKLEY

Industrial Engineer
Oneida Ltd., Oneida, N. Y.

WHEN your production involves the movement of tons of uniform castings or forgings, it's a relatively simple matter to engineer flow methods and containers that will keep the volume of parts moving from raw storage to final assembly. But when each small piece is an appearance item—a symbol of family prestige—the usual mass handling techniques will have to be broken down to finer points.

These must be designed to (a) segregate the several types of pieces such as spoons, forks, etc., (b) also those belonging to individual brands, and finally (c) those constituting different patterns within each brand. At the same time the routing through numerous processing steps must be done for economy of movement and protection of the finish.

ELECTRIC HOIST tilts drum to feed blanks to operators who rack pieces for annealing. Blanks travel through furnace on heat-resistant wire mesh belt.

HAND LIFT TRUCK has 18"x24" steel frame bed, is suited for loads in compact space.

Is your business "different"? Take a look at Oneida Ltd. Its Community Plate and 1881 (R) Rogers (R) are silverware names with a long tradition behind them—but in the Oneida plant you will see up-to-date material flow methods adapted to processes which are necessarily governed by long-established principles of painstaking craftsmanship. This "different" kind of industry is doing an exemplary material handling job in shop layouts and buildings that challenge an engineer's resourcefulness.—Ed.

Handling, Layout, Production Machinery

This is a condensed statement of the handling problems in the manufacture of silverplated flatware, the subject of this discussion. Oneida Ltd. has long been known as a manufacturer of sterling and silverplated flatware and hollow ware. Our company has been in operation as a corporation since 1880 and has majored in the silverware business since 1900. Community Plate and 1881 (R) Rogers (R) are among the main advertised lines which have enjoyed acceptance since the beginning of the century. Early in the present decade Heirloom Sterling was added.

Our factory buildings have served for decades. The introduction of modern material handling equipment has had to wait on modernized processing machinery. The planning of the handling facilities had to take this factor into account, as well as the special requirements imposed by multi-story structures. While some of these buildings are separated by yard areas, the processing cycle continues from one building to the next. This, in turn, demanded coordination of material movement for continuous flow between widely separated points on different floor levels.

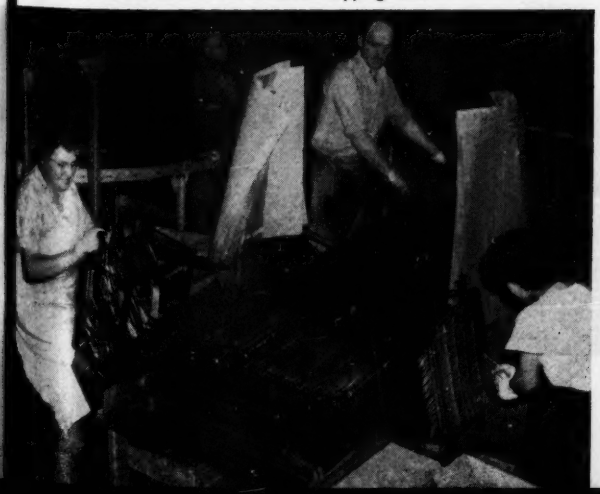
We feel we have made a good start toward a coordinated material flow on a plant-wide basis. Departmental refinements are necessarily continuing, which is typical of plants in any industry. Some of these later developments are only just now being tested, and are therefore omitted.

Crane Handling Compensates for Missing Dock

The nickel silver blanks for the flatware arrive in steel drums with

(Turn to page 64)

DOUBLE DECK gravity roller conveyor, left, delivers loaded wire racks to dipping line.



BELT CONVEYOR (end point) coordinates buildings, delivers silverware trays to plating.

Most manufacturers of industrial and material handling equipment are not in a position to maintain large engineering and research staffs for the testing and designing of brakes and clutches. As a result, they rely almost without exception on friction material manufacturers for developments and recommendations. The author outlines several significant trends.

Future Trends In Friction Materials in Material Handling Equipment

By H. W. OVERMAN
Brake Specialist, Philadelphia

Part III of Three Parts

IN THE automotive field, it has long been the practice for large manufacturers to maintain extensive brake and clutch engineering staffs, which are constantly designing and testing brakes and clutches in cooperation with friction material manufacturers. The importance of brakes and clutches to their over-all problems is therefore thoroughly recognized. Of course, their volume of business warrants the large expenditure involved.

Material handling equipment manufacturers are giving, either deliberately or unconsciously, more thought and attention to the friction material manufacturer from whom they buy their requirements. This is especially true of the equipment manufacturers who enjoy a successful business built up as a result of real service to their customers.

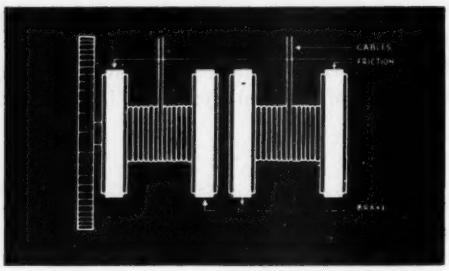
Friction Material Engineer's Function

Experience during the past few years has repeatedly proved that the sources from which an organization purchases its materials or parts are most intimately associated with either the success or failure of that business. These facts are thoroughly recognized by friction material manufacturers, who are constantly seeking to improve their friction materials with the following three basic facts in mind:

1. Better and more efficient performance.
2. Less scoring and drum wear.
3. Better control of friction characteristics.

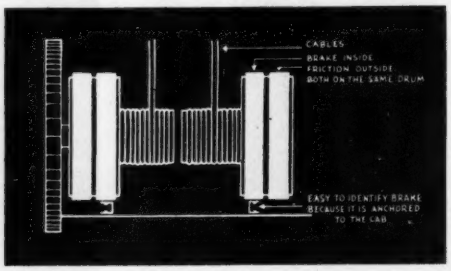
It is also the responsibility of friction material manufacturers to constantly improve methods, applications, and materials through the vast knowledge gained in their trade associations and testing programs.

When such developments reach the point of prominence that war-



▲ Above: Double Cable Drum with External Friction and Brake on separation drums.

Below: Split Cable Drum with External Friction and Brake on same drum. ▼



Engineered for the Job!

Many Towmotor Fork Lift Trucks feature specially designed accessories ***engineered for the job***—such as this revolving inverter device to "stir up" entire pallet loads of canned milk. There are many other Towmotor "firsts" developed to speed up every type of **M**ass **H**andling job . . . cut production time and costs . . . increase productive output. For more information, write for a copy of "Materials Handling Illustrated." Towmotor Corporation, Division 8, 1226 E. 152nd Street, Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.

TOWMOTOR
THE ONE-MAN-GANG®

FORK LIFT TRUCKS and TRACTORS

RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

WHAT IS YOUR PROBLEM?

Whether it is milk or machinery, Towmotor engineers have the experience background to solve *your* materials handling problem. Take advantage of this creative service for any industry, any plant—large or small.

ASK TO SEE THE NEW TOWMOTOR MOVIE, "THE ONE MAN GANG," IN YOUR OFFICE

rants industry-wide consideration, it is the responsibility of friction material manufacturers to pass along complete details to the industrial and material handling field.

Here is where the industrial friction material engineer enters the picture. It is his function to make available test data, conclusions, refinements and application details that are of interest to this field for possible consideration and use. His position is of extreme importance, for most industrial manufacturers must rely on his knowledge and ability to transmit information that will enable them to keep abreast of engineering developments.

Such engineers should also be consulted regularly by users who desire to change over, refine, or improve the performance factors of their own equipment. Often such an individual can quickly offer suggestions and ideas, drawn from his wide and specialized knowledge, that will not only improve the performance of your units but will also result in substantial reductions in maintenance costs. In other words, "modernization for profit".

Oversight Being Corrected

In the past, many manufacturers of material handling equipment have had to depend upon their own ingenuity or the trial and error method to satisfactorily brake or clutch a unit; while most of them have excellent engineering staffs they are not specialists in any one associated field. Consequently, this entire industry often lags somewhat behind the latest developments in this particular field of friction material application.

This can be definitely attributed to the lack or insufficient attention this field has received from the friction material manufacturers, both in the original equipment and replacement field. You will find this situation being rapidly corrected by those friction material manufacturers who have maintained consistent leadership in the industry.

Some Significant Trends

We will attempt to set forth a few of the more recent and far-reaching developments that will, undoubtedly, grow in use in our particular phase of industry.

The use of power, such as vacuum, air, and hydraulics, for the application of brakes and clutches has long been in use in the automotive field, but only within a comparatively short time have industrial and material handling companies started to use such methods. We do find several highly successful applications of these principles in material handling equipment. They open up new sales features, result in more compact designs, and longer trouble-free operation.

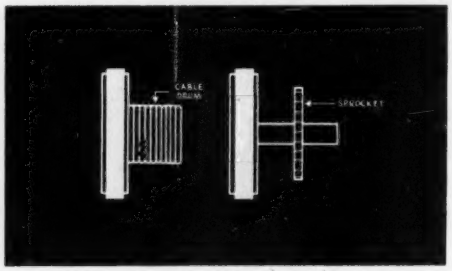
The use of such methods permits the consideration of friction liners having a much longer life cycle and smaller, more compact drums and sub-assemblies. As a result, it is also possible to give far greater consideration to internal brakes and clutches, which require less cumbersome and elaborate operating mechanisms.

All these facts add up to less physical exertion by the operator, resulting in more work in the same length of time, and lower maintenance costs. A few years from now will, undoubtedly, see a very wide use of these principles in the entire material handling industry.

Considerable work has been done in recent years with brakes and clutches that operate in oil or at least an oil mist. Some installations have been quite successful and it is in this particular field that bi-metallic friction materials have enjoyed considerable recognition. There are very definite future possibilities here and many developments should emerge in the not-too-distant future.

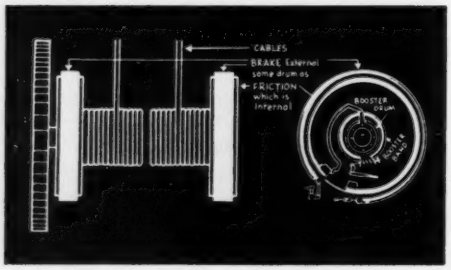
The use of electrical energy as power for brake and clutch operation is being pressed very diligently by at least two major manufacturers. Present designs have considerable acceptance in the automo-

(Continued on page 48)

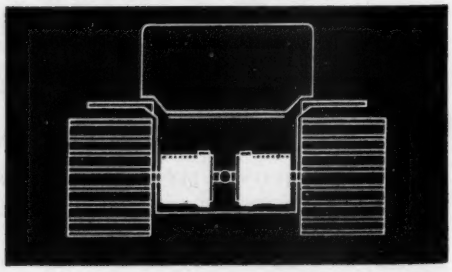


On some Shovels and Back Hoes a chain sprocket replaces the cable drum.

Split Cable Drum with Internal Friction and External Brake. (A Booster is found on large internal friction jobs.)



Crawler type tractor. Rear view, showing brakes and steering clutches. Steering clutches are all located in the same place but may vary in construction.



"We want THIS BAKER TRUCK!" said Taylor & Boggis Foundry Co.

So—We Sold Them the Pilot Model of Our New FT (100% Functional) Fork Truck which Had Been in Their Plant on Test

Put yourself in our place. Our engineers had been instructed to design a new 3000 to 4000 lb. capacity electric fork truck—a completely functional *"work horse"*—retaining traditional Baker quality and ruggedness and adding features that contribute to greater utility, safety and convenience.

For months they worked like demons—analyzing basic materials, testing controls, motor characteristics, hydraulic equipment, studying every essential truck function, designing, re-designing, assembling, re-assembling.

Finally they said—"HERE IT IS!"

"Looks like a lot of truck," said our management, "but how much will it cost?"

"LESS THAN ANY TRUCK IN ITS CLASS!" was the answer.

"Will it do the job?"

"LOOK AT THESE TEST RECORDS!"

Our engineers had subjected this truck to exhaustive tests covering every conceivable truck function. It had come through with flying colors.

BUT WE WANTED TO BE SURE!

So we selected a plant which had just about the toughest operating conditions you'll find anywhere, and put one of the pilot models on test there

This plant is a high-production foundry. Abrasive dust, heavy, punishing loads, typical foundry floor conditions, continuous, round-the-clock, three-shift operation —the most strenuous service you'll ever ask of a truck.

Frankly, no industrial truck had ever been able to "stand the gaff" in this foundry,

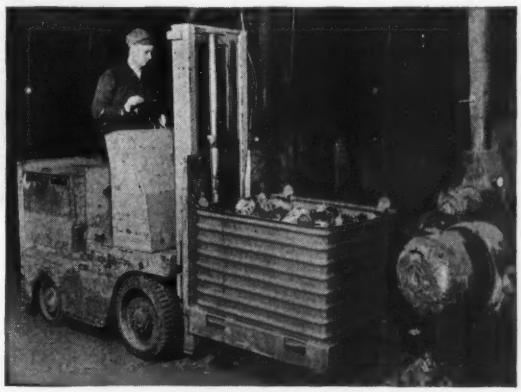
BUT THE BAKER FT DID!

From the day it was installed, there was NOT ONE MINUTE OF DOWN TIME!

As a result, the company insisted on keeping *this truck:* the pilot model which was in their plant on test!

●

That's the story of the development of the new Baker FT 3000 to 4000 lb. capacity Electric Fork Truck. Production models are now rolling off the assembly line in our new modern plant. Write us, or ask your nearest Baker representative to give you details on the toughest, lowest-priced, fork truck in its class.



Baker FT Fork Truck delivering rough castings to tumbling machine at the Taylor & Boggis Foundry.

THE BAKER INDUSTRIAL TRUCK DIVISION *of The Baker-Raulang Co.*
1219 WEST 80TH STREET • CLEVELAND 2, OHIO *In Canada: Railway and Power Engineering Corporation, Ltd.*

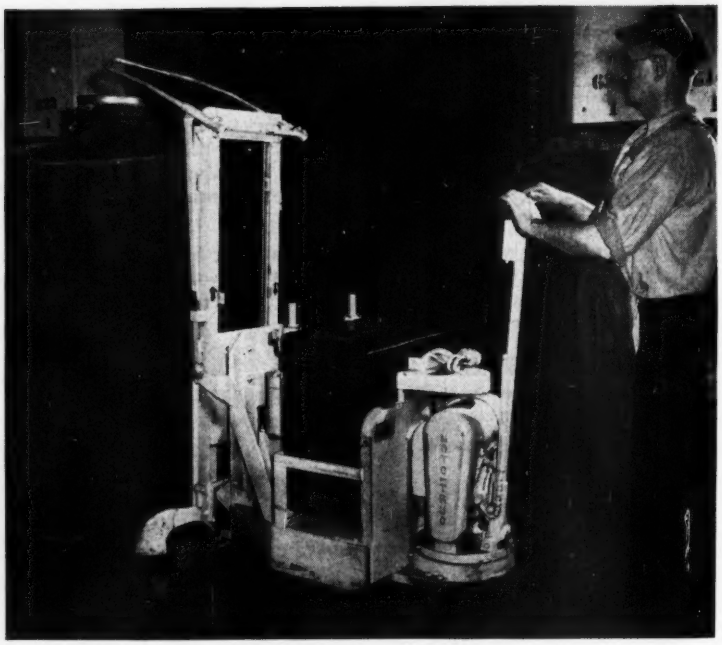
Baker INDUSTRIAL TRUCKS

LOW-LIFT HY-LIFT FORK & RAM CRANE TRACTOR PLATFORM

Fabric Rolls Safely Tilted from Vertical to Horizontal

By J. G. SCHLICHTER
Material Handling Engineer
The Firestone Tire & Rubber Co.
Akron, Ohio

This tire manufacturer increased efficiency of handling rolls of fabric by developing a "new" handling tool with an original modification of a walkie type motorized track: a concave lip was substituted for the fork and a hinged frame was added which tilts the rolls of gum-dipped stock from vertical to horizontal position.



1 APPROACHING LOAD. Hold-down clamp positioned to drop over shell when the . . . .

THE motorized hand-guided truck with the unusual modifications was developed as a handling tool for rolls of gum-dipped fabric weighing up to 1800 lb. and which are about 36″ in diameter. Thus the problem was a twofold one of handling a bulky as well as a heavy product.

The latest model of truck developed for this purpose in our calendering department has a kidney-shaped lip for a load carrier. It is attached to the specially engineered frame which is tilted at a 10-degree angle during transport and at 90 degrees when the roll is to be placed horizontally in the let-off on the calendering machine.

Evolution Through Early Modifications

Any new equipment, or radical modification, is the result of gradual evolution, and our case was no different. The costly and vulnerable nature of the product demanded "particular" handling that would avoid damage to the fabric.

Originally, these heavy rolls were propelled largely by manual effort. Among chief drawbacks were (a) weights too heavy for safe control of the loads and (b) too many man-hours of handling operators tied up in relation to material flow in other departments.

The original object was, therefore, to develop a truck which would pick up and transport the heavy rolls without undue physical exertion and danger to the product

—a truck, by the way, which would be compact for travel in narrow aisles when necessary. A hand-guided vehicle was indicated due to the shortness of the moves. Conventional forks were not advisable. The load-bearing surface had to offer maximum support for the bottom of the roll, without exerting excess pressure at a few points. Also, special provisions had to be made for the cylindrical shape of the roll, which had to be safely cradled in a vertical position against the truck frame during transit.

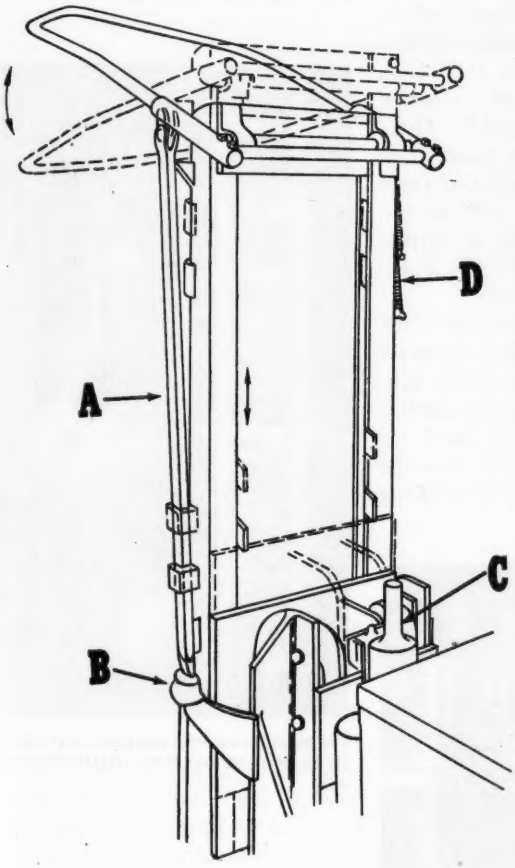
The first model had a frame which tilted backwards 10 degrees, which was sufficient as a means of retaining the load during travel. The load-bearing surface of this early vehicle consisted of short prongs which were five ins. wide and eight ins. long. The inside corners were cut out to conform to the round shape of the shell, which is the core on which the fabric is wound. The angle iron frame had two small wings at the top which cradled the rolls. The hold-down clamp consisted of a bar with a pin which was inserted into the open shell (the pin was a possible wear point). Notches in the bar were designed for manual adjustment according to the diameter of the roll, which varies somewhat.

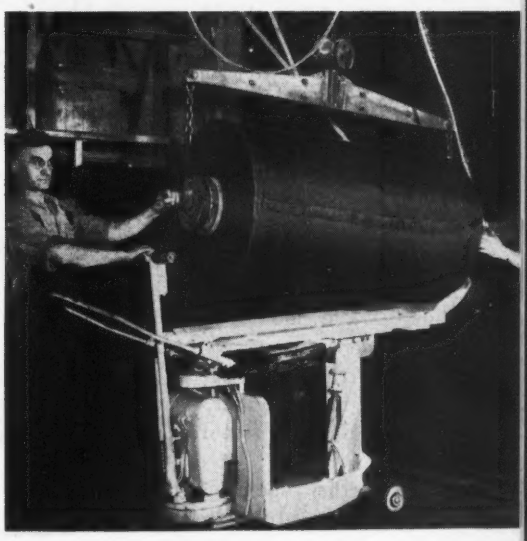
Refinements for Better Handling

This was a good start. However, the load-supporting prongs often marked or cut the rolls, and the frame did not give equal load distribution during travel. Because the rolls were not cradled properly, there was a hazard of their rolling off, with consequent danger to men, material and the equipment. The necessity for adjusting the hold-

2 CARRIAGE IS RAISED and lip engages roll. Load is tilted for move to . .

"A" is one of two side levers; "B", stop; "C", one of two plungers; "D" is the spring which applies tension to hold-down clamp.





3 CALENDERING MACHINE, Push-button then tilts load horizontally for handling by hoist.

down clamp likewise interfered with the best utilization of the equipment.

Our industrial engineering department continued its study of the problem. It was an important one in view of the tremendous tonnage handled in the calendering department. Refinements which were gradually engineered were incorporated in a second model, as follows. A kidney-shaped lip replaced the prongs; the new steel plate carrying member had the additional load-supporting area that was desirable. While the angle iron frame remained the same, the hold-down clamp was modified to a U-shaped retainer, with a turnbuckle for adjustment. This device, held by the turnbuckle to the frame, could not become disengaged from the load during travel, a safety factor. However, the disadvantage was that the looped section of the clamp did not always fit tightly around the shells. This also consumed time in making adjustments.

In working with these and other refinements, another factor assumed importance in our considerations. Up to this point, the rolls could be transported only in a vertical position. In order to mount them on the let-off of the calender they had to be positioned horizontally for engagement of the hoist hooks which lifted the rolls at this point. For this purpose, the rolls used to be pushed off the vehicles onto the floor. This tended to damage the ends of the fabric, besides constituting a hazard to operators. It was also desirable to avoid contact of the fabric with dust on the floor.

Final Model Is Developed

It occurred to company engineers that a 90-degree tilt of the carriage —bringing the load horizontal to the floor—would eliminate this extra handling along with the disadvantages inherent in it. Our engineering department was fortunate in having the advantage of a cooperative manufacturer, who put his full engineering resources at our disposal.

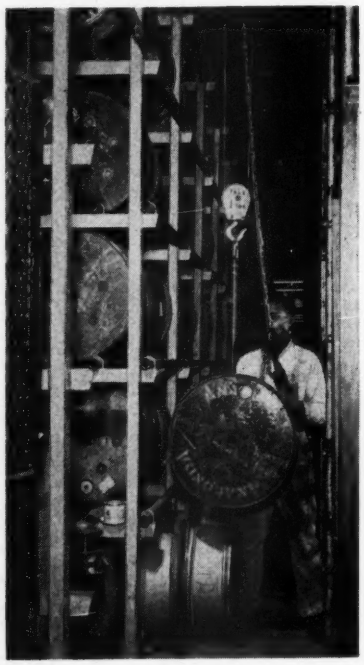
The further operating requirements mentioned resulted in the

Rack And Sling For Wire Reels

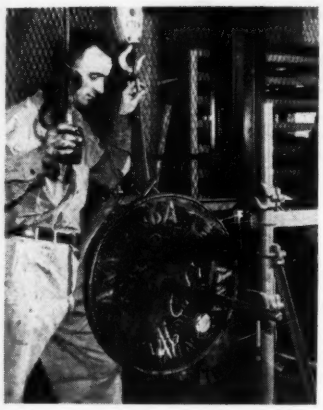
Storage racks, a 500-lb. electric hoist and a fiber belt sling are combined into an effective handling operation.

SOME valuable pointers may be found in the storage and handling practices at the Westinghouse Electric Corporation's Northwestern District Manufacturing & Repair Dept., Chicago. The storage room for magnet wire adjoins the coil winding department for transformers and motors. The wire is on reels 14" and 24" in diameter, the weight of the larger units approximating 300 lb. Hundreds of these reels are maintained in storage on the tubular and angle iron racks shown. A rack for the smaller reels is across a narrow aisle from the rack for the larger spools.

As one of the photos shows, the reels are stored on their edges on the lengths of tubing which support the load. A ¼-ton electric hoist runs on an I-beam track attached to the roof trusses over the center of the aisle. A fiber belt sling is used as a hoist accessory. The flat belt is looped around the spools for transporting purposes. Since the load is supported from the sling around the wire, it is suspended properly for insertion of the rod at the winding machine reel rack.



Top photo shows hoist-suspended real traveling to point of use. Note height of storage racks.



The reel, suspended by belt sling, has received rod and is ready for positioning on rack of winding machine.

following important changes in the hydraulic system and the carrying frame. The pump capacity was increased for greater pressure to provide for the increased tilting range. A spring plunger was located on the body of the truck to act as shock absorber when the heavy load was centered to the horizontal. This plunger also provided the initial push in changing the plane of the load from horizontal to vertical, which would be necessary only when the hoist was not ready to pick the load off the truck. In such a case, the rate of descent is controlled by the oil leaving the hydraulic cylinder.

The carrying frame was hinged in accordance with the new requirements, with a spring located at each side to aid in the tilting.

The studies continued, and other refinements were incorporated in the model, the third, which is in use today and which is shown in the exhibits. One of these improvements is a fully automatic hold-down clamp, which operates on a mechanical principle. To pick up a load, the carriage is raised; levers at the two sides of the frame ride free of stops, permitting the hold-down clamp to lower into position around the upper shell extension. For loads that have been unevenly rolled, a necked pin, carried on the truck, is inserted into the shell as a stop for the hold-down clamp.

To discharge a roll, the frame is lowered; the side levers are lowered to engage stops, causing the clamp to rise free of the roll (see the drawing on these pages).

To provide safe cradling for the long cylindrical shapes, a strap iron bar was attached to the inside of the angle iron frame on each side (with a sleeve clamp over a cylindrical trunnion). This form of attachment provides a one-in. play for load distribution, a feature which was lacking in earlier models.

A second spring plunger was added on the truck body to give additional shock absorption (when the heavy rolls descend to horizontal). The second plunger also gives added impetus to the "up" thrust

S-a-a-a-y, this new truck is TOPS!

You bet it's tops! This one-piece, arc-welded steel floor truck is built to roll smoothly as a baby carriage! It's light, but oh so rugged! A steel angle bar reinforces the full length of the deck. Top surface is clean as a whistle —no bolt heads, no rough spots. Corner pockets are inset-welded for extra rigidity, and rounded to prevent snagging.

Available with steel or steel and wood decks, level or tilt-type models, with easy-rolling, long-wearing Rapistan casters. (Your choice of Rapistan Steel-Forged, Flame-Hardened casters . . . or the exclusive new Rapistan Cold-Forged casters!) Push handles at one or both ends. Capacities from 650 to 6,000 lbs. Baked enamel finish.

Write today for prices and complete specifications!

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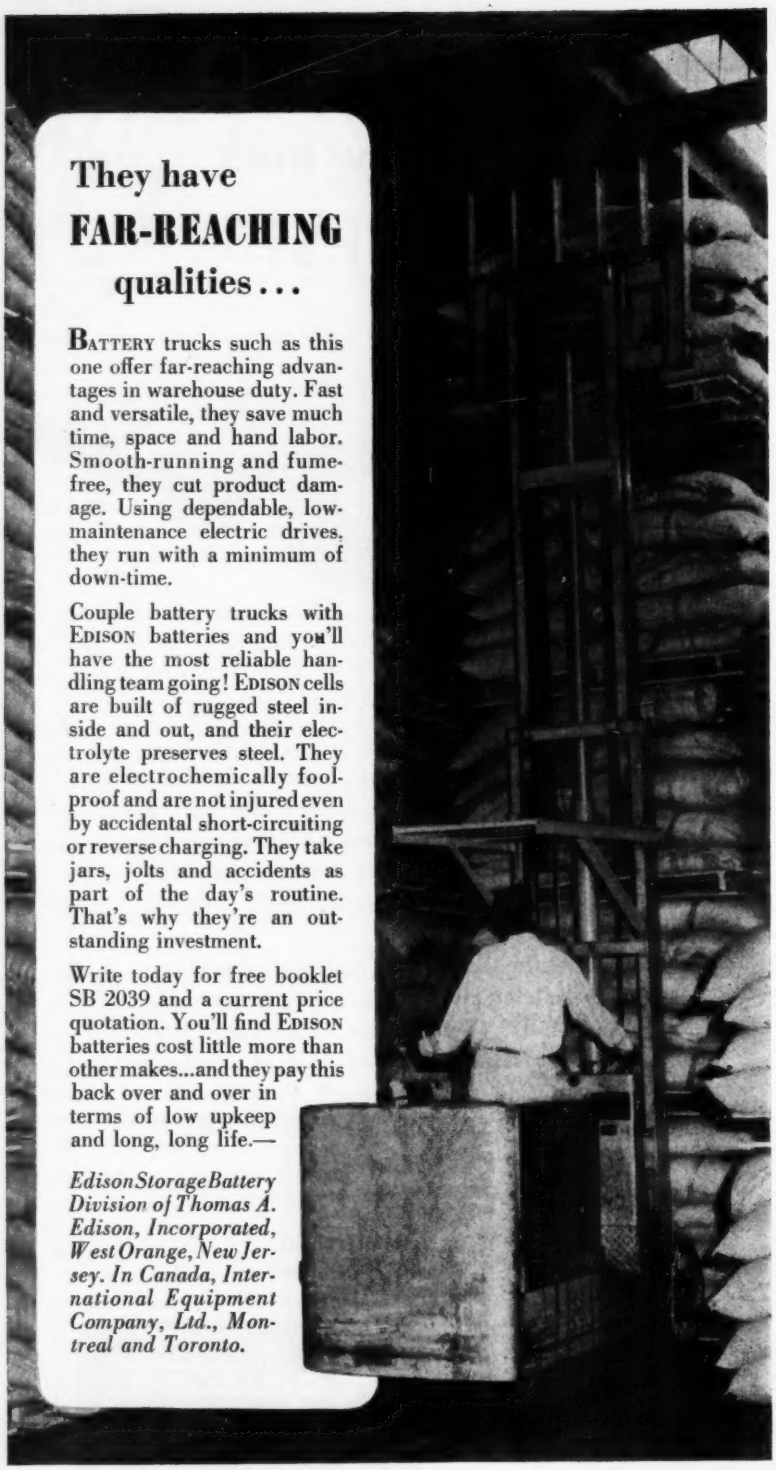
MATERIAL *flow* EQUIPMENT

CASTERS • FLOOR TRUCKS • HAND TRUCKS • CONVEYORS: Power or Gravity, Portable or Stationary



They have FAR-REACHING qualities . . .

BATTERY trucks such as this one offer far-reaching advantages in warehouse duty. Fast and versatile, they save much time, space and hand labor. Smooth-running and fume-free, they cut product damage. Using dependable, low-maintenance electric drives, they run with a minimum of down-time.

Couple battery trucks with EDISON batteries and you'll have the most reliable handling team going! EDISON cells are built of rugged steel inside and out, and their electrolyte preserves steel. They are electrochemically foolproof and are not injured even by accidental short-circuiting or reverse charging. They take jars, jolts and accidents as part of the day's routine. That's why they're an outstanding investment.

Write today for free booklet SB 2039 and a current price quotation. You'll find EDISON batteries cost little more than other makes...and they pay this back over and over in terms of low upkeep and long, long life.—

Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, New Jersey. In Canada, International Equipment Company, Ltd., Montreal and Toronto.

EDISON

Nickel · Iron · Alkaline

STORAGE BATTERIES

Typical Truck Battery

CONSULTING ENGINEERS DIRECTORY

MATERIALS HANDLING ENGINEERING

NEW METHODS OF MATERIALS HANDLING may reduce your Cost substantially. Further information without obligation.

GEMAR ASSOCIATES

Greenwich, Connecticut

when the load is to be returned to the vertical. Other refinements concern the addition of shields which were designed for safe retention of the load during transport and raising and lowering.

It should be mentioned that the hydraulic and electric controls are contained in the handle.

Meets the Requirements

The latest model has given satisfactory service since fall of 1949. The earlier models with a tilt of only 10 degrees were transferred for regular duty to the cutting room on an upper floor. The work requirements here do not necessitate the rolls to be transferred to a horizontal position. The heavy rolls are moved rapidly through the narrow aisles to the numerous cutting stations. Today this is a one-man operation, calling only for the manipulation of push-buttons.

In the calendering room, the latest model is proving its value 24 hours a day. The calender is supplied from the nearby warm room by a trucker. During the intervals when the truck is not used for this purpose, other operators keep it busy unloading rolls from highway trucks, which deliver the treated rolls for calendering from one of our other buildings.

The heavy loads are handled without physical strain on the part of the men, and the material is at the same time manipulated with complete safety. The equipment paid for itself in the first few months of its operation, and the company is considering purchasing additional units for other plants.

INSTITUTE CHAPTER AND ASSOCIATION ACTIVITIES

THE newest member of The Material Handling Institute, Inc., is the Signode Steel Strapping Co. J. M. Moon, vice president and director of sales, is the official company representative to the Institute.

MEMBERS and guests at the January meeting of the Northeastern Ohio Chapter (Cleveland) of The Material Handling Institute, heard E. B. Pilcher, superintendent of the Acheson Plant, National Carbon Co. His subject was "Unit Load Handling of Carbon and Graphite Products". Pilcher traced the development of the load unit handling program as it applied to his company during recent years. The progress of simplification in handling and the resultant aids to labor were emphasized. He reviewed several palletizing methods employed for various groups of material and illustrated these with slides. A discussion period followed the talk.

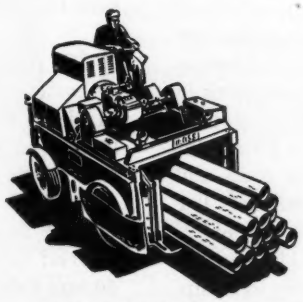
A NEW approach to the subject of material handling will be presented at the March 17 meeting of the Materials Handling Society of Philadelphia. The topic to be discussed is "How the Circus Gets Around". An executive of Barnum & Bailey-Ringling Bros. Circus will explain the problems in moving very diverse loads, ranging from fleas and elephants, between one-night stands. The Philadelphia group, at its February meeting, heard C. H. Barker, Jr., Lamson Corp., speak on the "Automatic Pallet Loader" and "Economic Use of Various Type Pallets".

* At Mechanical Handling Systems, Inc. it's CONVEYOR ASSEMBLIES

. . . are a "CINCH" for ROSS Lift Trucks

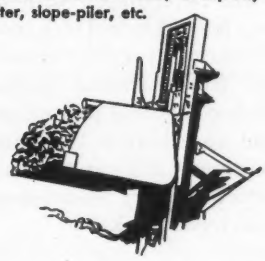
Handling this heavy unwieldy conveyor assembly is typical of the jobs expected to be done by ROSS Lift Trucks. And such unusual tasks are routine for the versatile ROSS. That is why more and more plants look to ROSS for time-saving, cost-reducing big-load material handling.

Profit from the experience of others . . . make the ROSS Lift Truck a vital part of your material-handling system. There is a wide range of dependable gasoline-powered models to fit your plant's specific needs. Three types, nine models . . . capacities from 5,000 to 18,000 pounds. Consult ROSS . . . it will pay dividends.



SCOOP ATTACHMENT

Permits lift truck to efficiently handle coal, sand, snow and other loose materials. Controlled from driver's position. Easily attached and detached. Fits all models . . . Other attachments include ram, snowplow, side-shifter, slope-piler, etc.



ROSS INDUSTRIAL CARRIERS

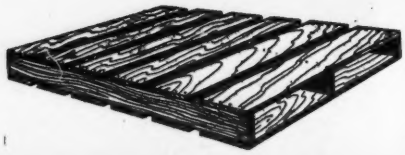
Five types, capacities 10,000 to 30,000 pounds . . . cost-cutting team-mates of ROSS Big-Load Lift Trucks.

Rely On ROSS

THE ROSS CARRIER COMPANY

280 Miller Street, Benton Harbor, Michigan, U.S.A.

Direct Factory Branches and Distributors Throughout the World

ON THE  PALLET

NEWS • VIEWS • TRENDS

ALL manufacturing plants in the six New England states in 1947 purchased 40 percent as much tonnage of iron castings as was used by Ohio manufacturers, and about 20 percent of the tonnage consumed by manufacturers in Michigan.—*Bulletin of Commerce, issued by the U.S. Dept. of Commerce.*

THE Beaumont Birch Co., Philadelphia, has announced the enlargement of its line of coal, coke and ash handling equipment. Specialists for over 45 years in air, mechanical and pneumatic bulk material handling equipment, the company is enlarging its services in the hydraulic material handling equipment lines. H. R. Pursel, recently appointed to the engineering staff, will head the Hydraulic Materials Handling Systems Department.

THE Colorado Fuel and Iron Corp. has consolidated its advertising offices. The director of advertising and the Western Division advertising manager will continue at the corporation's general office, Continental Oil Building, Denver. The advertising department of the Wickwire Spencer Steel Division, formerly located at 500 Fifth Avenue, New York City, will be identified as the Eastern Division Advertising Department and will be located in the corporation's general offices. G. A. Sabin, director of advertising, has announced the appointment of Robert W. Brown as Eastern Division advertising manager.

TOWMOTOR CORP. has opened a new factory sales and service branch in Oakland, California. Gordon Winters, formerly in sales supervision work in Cleveland, will be in charge. Located in a modern building at 4th and Castro Streets, the new Towmotor branch will be equipped with the latest tools and machinery for all types of fork truck maintenance. The service department will be under the direction of experienced factory-trained mechanics. The service will include convenient pick up and delivery of equipment and an extensive "on hand" stock of general items for prompt delivery to repair shop or customers. A bulk stock of heavy replacements will be carried for immediate repair work.

THE Apparatus Agency Division of General Electric's Industrial Divisions has been replaced by a newly-organized Agency and Distributor Division, according to an announcement by C. H. Lang, vice president and manager of sales of the company's Apparatus Department. George L. Irvine has been appointed manager of the new division, and R. D. Moore assistant manager. They will be responsible for the sale of all G-E Apparatus Department products through agents and to distributors, wholesalers, and dealers.

THE American Management Association reported that more exhibit space for the 1950 packaging show has been contracted for to date than the total of all space at the 1949 show. The show will be held at the Navy Pier, Chicago, April 24-27. In 1949, when the Exposition was held in Atlantic City, 207 exhibits utilized 115,000 sq. ft. of display space. By January 1st of this year more than 128,000 sq. ft. of space had been allocated to exhibitors. Officials stated that additional space is still available. According to present indications, total space used may reach 140,000 sq. ft., nearly 25 percent more than last year.

EMERSON H. FAIRCHILD, who had been in the material handling industry for more than a quarter of a century, died recently. He was 59 years old. At the time of his retirement last year, his firm, the E. H. Fairchild Co., New Orleans, was sales representative for the Automatic Transportation Co. in the Louisiana, Mississippi, and Alabama territory. He had held the franchise for more than 10 years.

THE Atlanta Paper Co. has opened a new building costing one and a half million dollars on Atlanta's Marietta St. The 275,000 sq. ft. structure houses the largest paper products converting plant under one roof in the South. The loading platforms, running down both sides of the 900-ft. building, can accommodate 50 trucks and 22 box cars at one time. The railroad spur is 1600 ft. long, and, with three switches, 60 cars a day can be handled. The most modern handling equipment has been incorporated into the new structure.

A NEW method of computing potential return on capital invested by metalworking manufacturers in new machine tools has been devised by the National Machine Tool Builders' Association, Cleveland. Pre-

(Turn to page 70)

MEN IN THE NEWS

N. A. FOWLER, director of sales of the General Box Co., Chicago, has announced the consolidation of the company's Chicago and Louisville sales territories. The headquarters of the enlarged territory will be located at Louisville. The following personnel changes were announced.

Vice-president George T. Walne will be transferred from Chicago to Louisville. He will be in charge of sales for the combined territories.

C. L. Bruckert, who has administered sales in the Louisville territory, will be promoted to division sales promotion manager.

Wm. C. Embry of Louisville, vice-president and member of the company's board of directors, remains as division manager.

E. T. SPROULL, president of Brainard Steel Co., Warren, Ohio, has announced the appointment of Thomas J. Moore, Jr., as vice president and general manager. Moore will continue to act as vice president of the Sharonsteel Products Co. He was actively instrumental in organizing Sharonsteel when he joined it after the War.

NEW assignments for five key men in the General Electric Co.'s Apparatus Department, Schenectady, N. Y., have been announced. T. D. Foy was named administrative assistant, Small Apparatus Divisions, by N. M. Du Chemin, assisant general manager of the Department. F. T. Lewis, manager of manufacturing, Small Apparatus Divisions, named as his staff assistants F. J. Boucher, D. S. Lisberger, and H. B. Miller. B. A. Case, manager of engineering, Small Apparatus Divisions, announced the appointment of T. L. Mayes as his staff assistant.

CARL F. NORBERG was elected executive vice president of The Electric Storage Battery Co., Philadelphia. He has been vice president in charge of manufacturing since 1944.

CARL J. SHARP, president of Acme Steel Co., Chicago, has announced that the board of directors elected H. L. Bills as vice president in charge of industrial relations. Bills has served as director of industrial relations for the company since 1937.

Bills is currently Chairman of the Legislative Committee of the Illinois State Chamber of Commerce. He is a past president of the Industrial Relations Association of Chicago, a member of the Industrial Relations Committee of the American Iron and Steel Institute, and a sponsor of the Industrial Relations Seminar at the University of Chicago.

9 out of 10 companies can save on shipping with ACME STEELSTRAP

45,000 users have proved it . . .

Timken Roller Bearings are boxed neatly, securely, and economically—with Acme Steelstrap!

How Timken cut packaging time!

Yes, this company cut packaging time when they set up a packaging production line using Acme Steelstrap and Acme equipment.

But that's not all. The appearance of the package was improved and it was made stronger and easier to handle in pallet lots. The expense of dunnage was reduced!

If you box, bundle, crate or bale your product, you, too, should be able to make important savings with Acme Steelstrap and Unit-Load Band. Ask an Acme Shipping Specialist to make a free analysis of your packaging and shipping operations. Or ask for free booklet, "Savings in Shipping." Mail the coupon today!

STRAPPING DIVISION

ACME STEEL COMPANY

NEW YORK 17 ATLANTA CHICAGO 8 LOS ANGELES 58

ACME STEEL COMPANY, Dept. F-30.
2838 Archer Avenue, Chicago 8, Illinois

☐ Send free booklet, "*Savings in Shipping.*"
☐ Have representative call.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

NEW Department Store W

"This building is a dollar-saver and a customer-keeper because we've worked out the simplest, easiest method of doing each job and then constructed a building to house the methods."—Fred Lazarus, Jr., chairman of the board, F. & R. Lazarus Co.

MOBILE storage practices and "straight-line" flow are the keynote of the new bulk goods warehouse of the F. &. R. Lazarus Co., Columbus, Ohio. "Mobile" refers to the policy of operating with an absolute minimum of fixed facilities, and the material flow is as direct as it can be—moving from the receiving doors at the north to the shipping doors at the south.

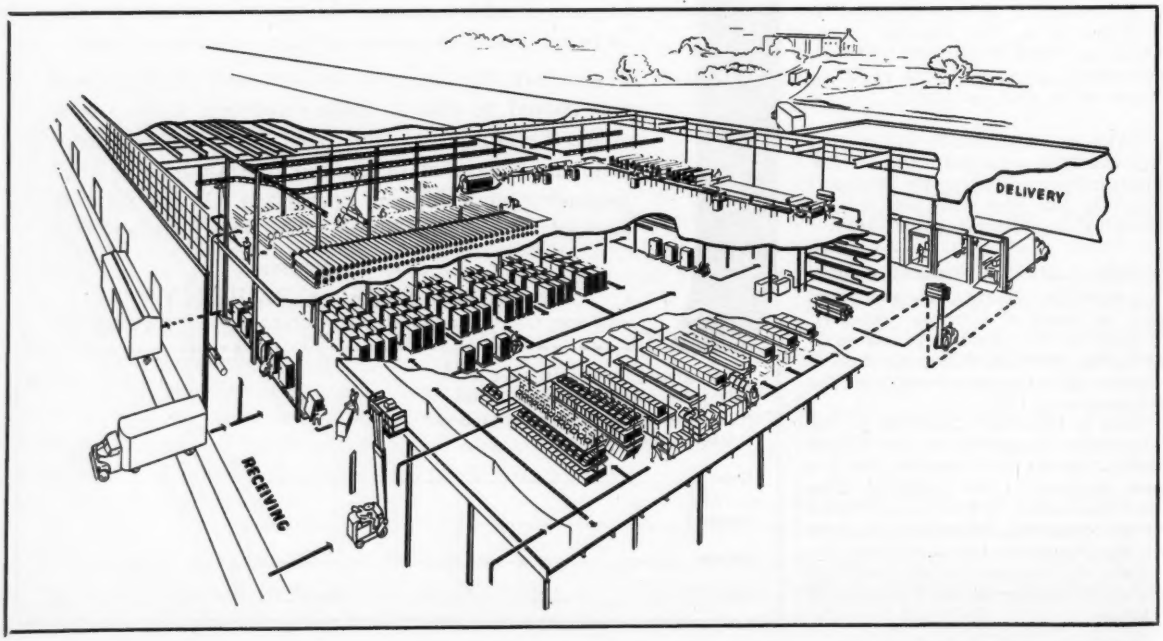
The building consists of a ground floor totaling 165,000 sq. ft. and a mezzanine, 10½ ft. above the lower level, with an area of 100,000 sq. ft. The structure is designed for receiving, storage and shipping of the well-known department store's bulk goods. Examples are furniture, electric appliances, radios, carpeting. Inspection and repair departments are included in the facility.

900 Pieces of Rolling Equipment

The horizontal movement of merchandise was assigned to platform trucks, light-duty industrial tractors, several hundred four-castered dollies, monorail and gravity roller conveyors. To a limited extent fork trucks are also used for lateral transportation. Vertical movement is accomplished by fork trucks, electric hoists (operating on the monorail system) and a chute. The equipment includes almost 900 pieces of rolling stock, chiefly cas-

See the "Ideas" on the facing page — engineered techniques which are assembled here from the Lazarus methods for your convenient reference.

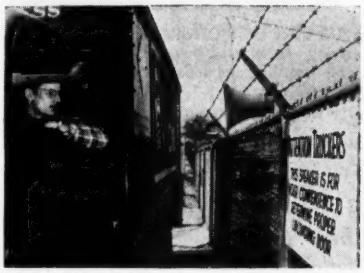
PLANNED FOR FLEXIBILITY. Goods are received at left, flow on two levels to shipping docks at right. Fixed installations are minimized by numerous caster applications.



IDEAS FOR YOUR NOTEBOOK

Plan for Mobility, Short Moves

BUILDING features and storage facilities speeding the material flow: 14 truck doors and a six-car-capacity railroad siding for receiving on the



TWO-WAY SPEAKER SYSTEM gives driver the designated unloading door for his load.

north end, with 22 loading doors at the south. Each class of merchandise is thus received near its inspection-storage location. A two-way loud speaker tells drivers at which door to deliver the merchandise. The only partition is a fire wall which divides the structure in two parts.

Vertically adjustable storage racks conserve floor space. The racks are for the most part constructed of angle iron frames with wooden platforms. While these are adjustable, they are not often changed due to the constant size of most of the merchandise. However, they may be easily reset if necessary. Most of the platforms are four ft. above the floor; some are 5½ ft. high. In both instances, goods are stored on the floor beneath the platforms. Lighter loads are stacked on the decks to facilitate placing and removing by operators. This merchandise includes lightweight furniture, cartoned goods, lightweight kitchen components, tricycles, etc.

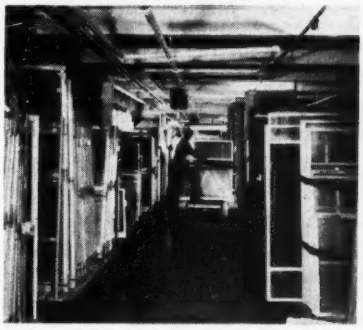
Processing Before Storage

UNLIKE the practice of most department stores, all arriving merchandise is inspected and processed *before* being put into stock. Thus, defective merchandise does not take up storage space, and disappointing of customers is minimized. Another important benefit is that this practice regulates the amount of processing work to highly skilled repair and finishing operators. With the earlier "processing after storage" method, these operators were idle during some periods, and could not keep up during peak seasons.

Special Stock Handling Methods

WHILE "processing before storage" is the rule, certain awkward items form a partial exception: mattresses, bed springs, baby carriages, power tools, etc. About 10 per cent of these containers are opened (an active reserve stock for immediate shipment), and all crates and containers checked for shipping damage. As the stock moves out, more containers are opened to maintain the 10 per cent active reserve.

Very heavy merchandise is sometimes stored in original crates if they have



STORM WINDOWS and doors remain on floor trucks during storage, promoting flexibility.

clearances for fork truck entry. More often such items are uncrated and placed on four-castered dollies (after processing).

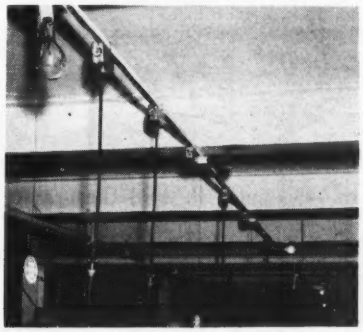
Storm windows and doors. Because of their space-consuming design, these items are stored on four-wheel platform trucks. This avoids fixed racks. Pipe supports were added to the trucks, which permitted vertical storage of the doors and windows. Result: only two handlings—at receiving and shipping.

Storage Pattern

WEIGHT of goods is a major determining factor. Heavy items are stored on the main floor, lighter ones on the balcony. Within this pattern, the fast moving ones are maintained on the perimeter of the main level; the second fast items on the outside of the balcony. Other goods are placed toward the middle of the main floor, then on the mezzanine. The latter also serves for overflow storage. This pattern contributes to efficient order selection and low damage rate.

Lights Where You Want Them

POOR lighting in out-of-the-way areas can mean danger to personnel and goods. At the F. & R. Lazarus Co. warehouse, trolley ducts on the ground-floor and mezzanine levels give a supply of electric current in every

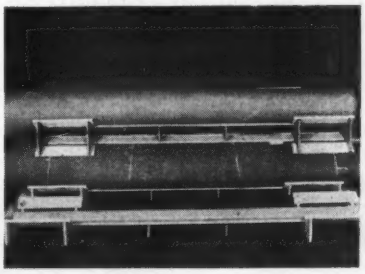


CONTINUOUS TROLLEY DUCTS provide as many outlets as needed throughout plant.

part of the building. Electrical outlets and specially designed lighting fixtures are attached to overhead rails, as shown in one of the exhibits. This permits concentration of light and power facilities in testing areas and workshops for electrical facilities, and avoids maintaining more than necessary in other sections.

Carpet Storage

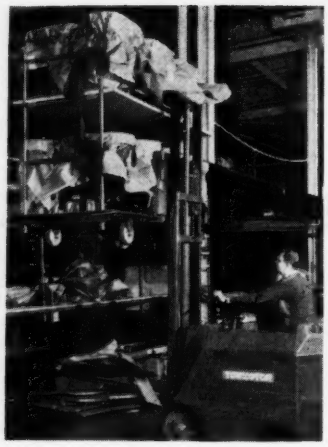
THE principle of using a minimum of fixed facilities is likewise illustrated by the V-shaped cradles used for car-



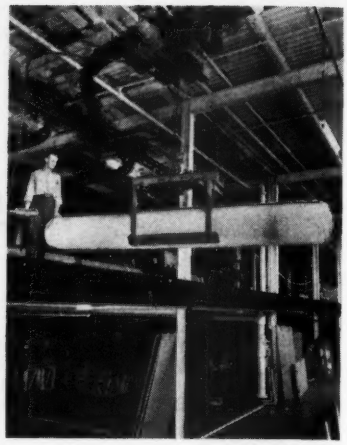
SPECIALLY DESIGNED PALLETS, built by company, prevent shifting, avoid fixed racks.

pets. The layers are built up by means of these retainers, as illustrated, to a height of four. Individual rolls are thus easily reached and shifting of piles is avoided. Extra storage space was gained for other merchandise.

ACCORDION DOCK COVERS protect workers, goods. Merchandise is unloaded onto platform trucks, moved to receiving aisle.



FORK TRUCK deposits loaded "float" on mezzanine. The operation is reversed for shipping. Truck underside has sleeves.



SPUR LINE OF MONORAIL serves carpet receiving. An electric hoist with a grab serves inter-floor lifts and departments on mezzanine.

tered. The monorail trackage totals to 1080 lineal ft., and the gravity rollers to 200 ft. The amount of castered equipment gives a partial idea of how "mobility" is maintained. For other ways in which this principle is implemented see the paragraphs in this article appearing under "Ideas For Your Notebook".

The routing of arriving goods through the plant is taken care of before they are unloaded from the carriers. If shipment is by rail car, a specific receiving door is noted on the original purchase order. When a highway truck enters the grounds, the driver calls the contents and the manufacturer's name into a two-way loud speaker attached to the fence, without having to leave his cab. The office calls back the door number to the driver. Accordion-type canvas dock covers are pulled flush with the doors of the vehicles for weather-free operation.

A "Mobile" Layout

Just inside the receiving doors is a 10-ft.-wide aisle in which merchandise is placed awaiting processing (inspection, cleaning and minor repairs). The several processing shops are strategically located in relation to the receiving aisle, and hence all moves are kept to the shortest distances. Similarly, the final inspection department through which all goods must pass for a "once-over" is located in the south portion of the main floor near shipping. Waste ton miles, a hidden cost factor in many warehouses lacking flow engineering, are at an irreducible minimum.

Most types of merchandise are unloaded from the carriers on four-wheel 3½′ x 7′ shelf trucks. (Exceptions are refrigerators, gas ranges and floor coverings.) Pipe supports at each end of these trucks are designed to hold additional shelves, which convert the units into two, three or four-deck carriers. The merchandise travels on these vehicles through uncrating, inspection, processing and to storage. In this connection, see the "Notes" on storage practices and the significance of the adjustable racks that are used.

After the merchandise has been unloaded and stacked, the empty platform trucks are returned to the receiving area; or, merchandise may be loaded on the empties for movement to shipping. When a number of the trailers are to be returned they are coupled together and hauled by one of six light-duty industrial tractors of the three-wheel type.

A THREE-WHEEL TRACTOR hauls refrigerators on dollies which act as mobile racks in storage. Size of dollies is designed to prevent damage to merchandise through bumping.

Vertical Movement

Refrigerators and ranges are unloaded from incoming carriers (often by fork truck when the crates are designed for fork entry), and placed on one of two 45-ft. roller conveyors for uncrating. The units are then loaded on 3′ x 4′ four-castered dollies, on which they are stored. Since the dimensions of the dollies are larger than those of the refrigerators, damage of the merchandise through bumping is avoided. Like the trailers, the dollies are coupled into trains and hauled by one of the tractors to the storage location. More than 600 dollies are

in use continually. These castered carriers are an important aid in keeping storage "mobile". This means, of course, that the dolly-stored items are handled only twice —once onto their carriers and a second time when they are lifted off in shipping for delivery.

Power equipment is used only on the ground floor (with the exception of the electric hoists), and hence the foregoing applies to this level of the operation.

If the products are destined for mezzanine storage, the loaded flat trucks are picked up by fork truck and deposited on the upper level, whence they are wheeled to the proper stacks. The 14-ft. lift of the 4000 lb. capacity trucks is ample for the 10½ ft. height of the balcony.

As on the ground floor, the empty trucks are used for order picking and, when loaded, wheeled to the shipping (south) side of the mezzanine deck. A fork truck on the ground level picks off the loads for movement to the outbound carriers. In the planning stage, all materials were carefully scrutinized for mezzanine storage on the basis of their weight and bulk. Safety, short moves and absence of physical effort were guide signs in this respect.

Monorail for Floor Covering

Incoming rolls of floor covering (broadloom, padding, and linoleum) are unloaded by fork truck. (The method is to roll the material onto the forks.) As the flow diagram shows, the receiving area for the rolls is located under a spur of the monorail trackage which covers about one third of the mezzanine area. Two electric hoists are used for lifting the rolls to the upper level and placing them in storage. The special cradles that were developed in this connection are described in the "Notes". These lifting tasks are performed with one motorized and one manually operated grab.

Hoists again move these cumbersome rolls from storage to the workroom, where cutting, stitching, sewing, re-rolling and wrapping are done. Following is an example of the efficiency of the present operation in relation to adequate work areas and handling tools. In the old warehouse, it took almost three manhours to get one roll of broadloom from a box car to an accessible area in the carpet workroom. Now, a comparable roll of this material is moved from car to storage in 20 minutes—and from storage to the cutting floor in six minutes. The processed and wrapped carpeting is delivered via chute to a waiting stake truck on the ground floor.

The time-saving example given is typical and points up the significance of the engineered flow methods in the F. & R. Lazarus bulk goods warehouse. The handling tools provided for this material indicate the absence of heavy physical labor on the part of the men. Damage to the merchandise is likewise avoided. The cradles that were designed for storing the rolls con-

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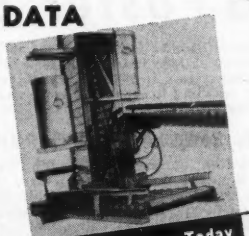
ENGINEERING DATA

BELT — heavy 18 gauge steel.
WIDTH — 12 inches to 30 inches.
LENGTH—5 feet to 30 feet.
SPEED — Up to 50 feet a minute.
H.P. REQUIRED — ½ to 2 horsepower.
LOAD LIMIT — (recommended) 50 lbs. per arm. This can be exceeded 50%.
PULLING LOAD LIMIT—1000 pounds.
ARMS — 18 inch maximum length.
Can carry a load up or down.



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tribute to economy of operation through maximum utilization of available square footage. So does the time-saving factor. These typical advantages apply variously to the handling of all categories of merchandise. Lumped together, these improvements mean better service to F. & R. Lazarus customers. In other words, the foregoing are concrete examples of the "dollar-saver and customer-keeper" mentioned by Board Chairman Fred Lazarus, Jr.

Short Moves—Consistently

All goods other than floor covering materials move through a centrally located inspection station on the first floor (in the normal course of travel). If re-packing is necessary (some goods are re-wrapped before going into storage), they are first sent to a nearby packing department, then to an accumulation area where the loads are assembled by routes. Since all exits are numbered according to specific routes, the dispatching function moves along with smooth efficiency.

Two-wheel and four-wheel push trucks are variously adapted for loading. Some of these vehicles are padded with carpeting to prevent scratching of the furniture. Some platform trucks are fitted with vertical supports for handling mirrors and similar items.

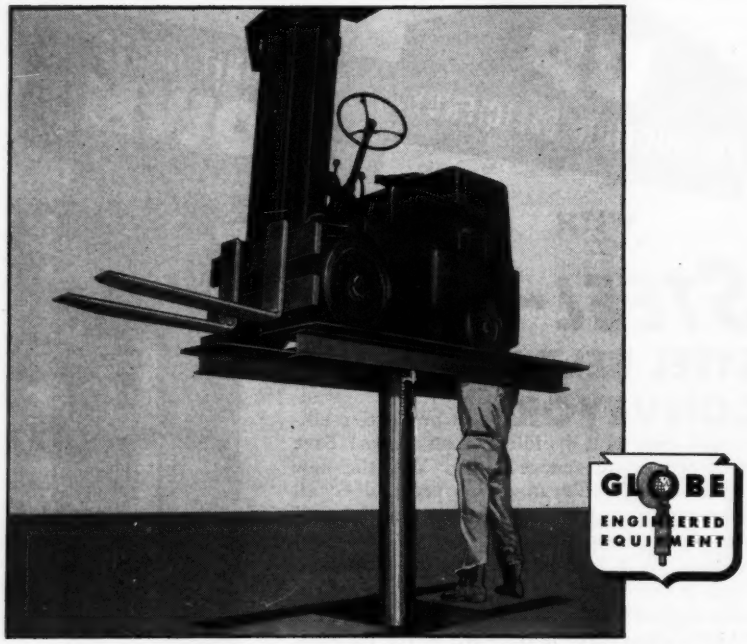
The bulk service building also processes "returns" from customers. Such goods are classified according to whether they are returned for (a) credit or (b) repairs. The "for credit" returns are tagged and sent to the plant servicing department. Like other incoming goods, this merchandise is also received at the door closest to its destination. The same applies to "repair" goods. Moves are kept short—consistently. These two service functions constitute an important part of the building's usefulness.

Stock Control—Order Selection

Systematic stock control and record keeping methods are vital to the effective operation of the company's bulk handling system. A policy of minimizing paper work and record keeping is reflected in the following order selection set-up which keeps close control on each individual item in the bulk service building. The lettering and numbering of all bays and aisles facilitates this system, which is as follows:

1. Merchandise is received and a report written. 2. The report is sent to the building office where a duplicate slip is made out. 3. The duplicate is attached to the individual item and the stock location indicated on the master which is sent the downtown sales office. 4. After a sale is made in the store (from a sample unit), the sales check is sent to the main sales office. 5. The master ticket is pulled out and attached to the sales ticket and sent to the bulk service building. 6. Stock is pulled and sent to shipping.

This simple system is in keeping with the physical methods used in the building. An indication of its



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TRACTOR-TRAIN of loaded platform trucks. Two more decks are added for small items.

DELIVERIES ARE ACCUMULATED on trucks and on the floor behind designated doors.

success is the fact that more than 107,000 lb. of merchandise have been handled in one eight-hour day. This point gains in significance when it is brought out that this tonnage consisted of 1436 packages which were delivered by 44 carriers. Another example of the operation's effectiveness is shown in "will-call" handling. If a customer desires to pick up the merchandise, it is waiting by the time she has traveled from the downtown store to the service building, a distance of little more than one mile.

Veteran Employees Polled

This outstanding example of handling did not "just happen". Many months before ground was broken on the new structure every person connected with the old warehousing operation was polled as to the improvements that could be made. A great number of these suggestions, gained through years of experience, were introduced into the new layout, methods and choice of handling tools. Thus the new warehouse also reflects the value of the company's policy of management-employee cooperation. It is evident in other phases of operations at F. & R. Lazarus Co., which is today recognized as one of the country's leading department stores.

The various examples given on the efficiency of in-plant methods are matched by the performance in delivery. Company spokesmen indicated that delivery time has been cut by about 50 per cent.

The value of polling veteran employees is well demonstrated.

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to do a ONE MAN JOB!
When there's loading or unloading to be done at your plant, you can be time and money ahead by using Magliner Magnesium Dock Boards. With a Magliner Dock Board, one man can do the job, instead of three or four, because Magliner provides "bridge design" structural strength at less than ⅓ the weight of steel! Analyze and compare! The cost of Magliner Dock Boards is far less than the cost of being without them. Write for descriptive bulletin.
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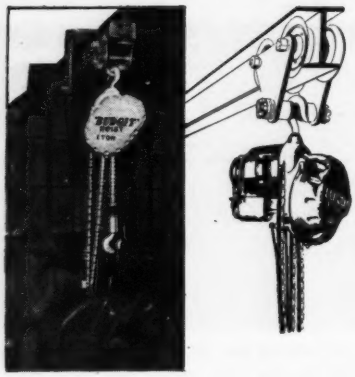

the clock decides

The clock decides how much productive work your men can do in a day when all their energy goes into the useless waste of manual lifting — lifting heavy tools at their work benches, heavy machine parts or machines on which they're working. Here at the work benches; on production, assembly, or inspection lines is a good place to cut production costs with a 'Budgit' Electric Hoist doing all the lifting.

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'Budgit' Hoists are a complete lifting unit in themselves — so, there's nothing to buy before you start lifting loads with them. No wiring, no conductor system, no installation costs — you simply hang them up where there are loads to lift, plug into the nearest electric socket, and use!

Made in sizes to lift 250, 500, 1,000, 2,000 and 4,000 lbs. Prices start at $119.00. Write for Bulletin No. 391.

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FLOW DIGEST

The subject matter contained in each of the following digests was obtained from the magazine to which we give credit below.

Brick & Clay Record, Jan. 1950. "Latest Thing In Brick Handling," page 40. Load unit shipments of brick in fibreboard containers as a new trend in the brick industry. The loads are formed on a scored fibreboard base, constructed to allow fork truck entry; additional fibreboard sections comprise the sides and top and the load is secured by steel strapping. 500 bricks are handled at one time. Six major operating economies are listed.

Chain Store Age, Jan. 1950. "Warehousing Handling In The Store," page 63. How one food store chain extended the use of pallets and hand-lift trucks, formerly found only in its warehouse, to some of its larger retail outlets. Pictures show neat stacking, easy movement of large loads. Load units are handled from the incoming delivery vehicles to the stockroom, then to the sales area at night. Also:

"Tailor Made Warehouse," page 72. A warehouse was designed to meet the need for fast, economical handling of foodstuffs of a 40 per cent larger variety than most warehouses serving a chain of stores. The heart of the material handling system is an overhead chain drag line which hauls order trucks through the stock assembly area. Palletized goods on racks which are placed at an angle to the aisles constitute an important feature of the system. The layout was complicated by the building's shape.

Food Packer, Dec. 1949. "One-Man Factory-Feeder," page 23. A pallet-unloader and lug box dumper handles 58 tons of raw fruit per hour at a packing plant. Rated capacity of equipment is given as 3000 boxes hourly. The method, said to be spreading, employs a lift truck which supplies the machine.

Foundry, Jan. 1950. "Core Handling Simplified," page 138. A modernization program in a foundry core room incorporates new baking facilities and more efficient core-handling equipment. Four major benefits include increased production of castings by 50 per cent, lower production costs, maintenance cost lowered 25 per cent, and improved quality of cores. Also:

"Mechanized Foundry," page 66. Production was tripled with the installation of mechanical equipment in one foundry. Molds are now dumped automatically, iron melted continuously. The stockyard is served by a gantry crane. Additional new equipment includes skip hoists and belt conveyors.

Iron Age, Jan. 1950. "Modern Material Handling Techniques Highlight AL's New Melt Shop," page 78. A picture story on a steel company's new melt shop, with layout sketch. Scrap is handled by bridge crane with a magnet, limestone with a 1¾-yd. clamshell. A powered scoop truck handles the same bulk material under different conditions. Load units of electrodes made possible with specially designed pallets and steel strapping. Individual handlings decreased.

Manufacturing & Industrial Engineering, Jan. 1950. "Modern Methods And Equipment Provide Fast And Efficient Plant Handling," page 24. Benefits of planning production flow and handling with scale model before the foundation was dug on a new building. Fork trucks and a hand-guided powered vehicle for on-the-floor movement; a traveling bridge crane and standard and jib hoists for overhead operations.

Paper Mill News, Jan. 21, 1950. Special material handling issue, with equipment survey tabulation. "Materials Handling—Industry's Last Frontier," page 24. Eight avenues of savings through the use of material handling equipment. Other topics include necessary modernization trends, specific case studies, future industry-wide developments and handling of multiple tonnage. In-plant, yard moves, packaging and storage procedures are presented as phases of handling. Also:

"Material Handling of Pulpwood," page 28. Geographical and climatic differences are given as two forces which largely regulate handling practices. Four drawings show typical layouts of pulp mills in relation to surrounding areas; also location handling equipment for efficient transportation of raw materials from waterways, incoming carriers and stockpiles. Case studies of equipment and methods.

President J. W. Moran of Baker-Raulang Co. Addresses Material Handling Class

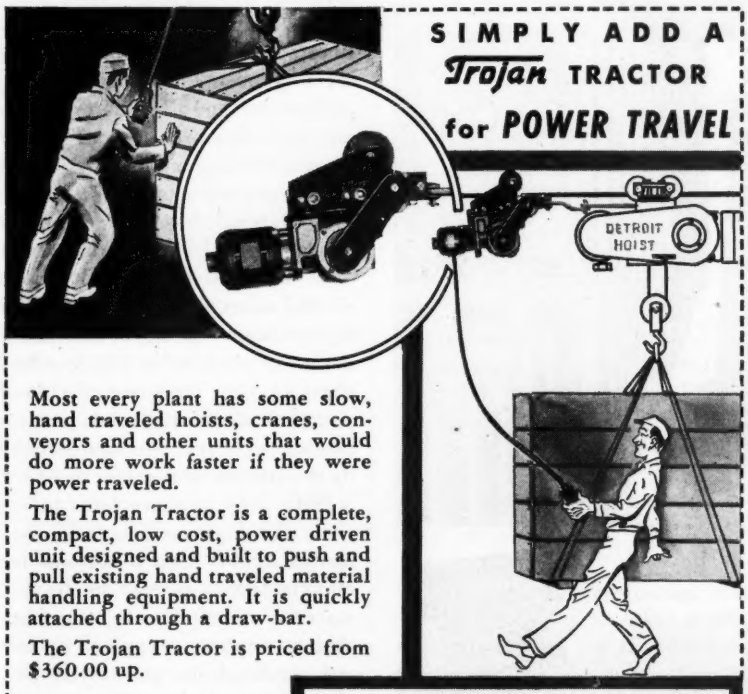
J. W. Moran, president of The Baker-Raulang Co., Cleveland, spoke before the graduating group of Fenn College's fifth course in Material Handling Fundamentals on January 26, at the Cleveland Engineering Society headquarters. Fenn is believed to be the first of some 35 schools now offering courses on material handling.

J. W. MORAN, president of the Baker-Raulang Co., presents graduating certificate to Charles E. Sweeney, member of graduating group of Cleveland's Fenn College.

The birth and growth of the industrial truck industry is closely tied in with the technological development of American industry, Moran said. Probably not more than one-fifth the man-hours goes into one of today's automobiles in comparison with a car assembled in 1910. Importance was first attached to the development of machinery which would do more work per man-hour. Industry then began to look for other avenues of cost saving and found material handling equipment offered an opportunity for a direct savings due to reduced handling costs and lower production costs.

The birth of the industry took place in the railroad service in 1909, Moran continued. Early orders were divided between four-wheel tractors and platform trucks. The modern self-loading vehicle had not come into being, although a few platform trucks of the low-lift style could pick up and carry loaded skids. These were also fitted with various attachments.

Moran traced the beginning of early vehicles such as the low-lift platform truck in 1918, the ram truck in 1920, and the high-lift platform truck which was soon modified with forks. He also discussed the advent of special application models. He concluded with a forecast of the future of the material handling industry, which is expected to be very good.



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The Trojan Tractor is a complete, compact, low cost, power driven unit designed and built to push and pull existing hand traveled material handling equipment. It is quickly attached through a draw-bar.

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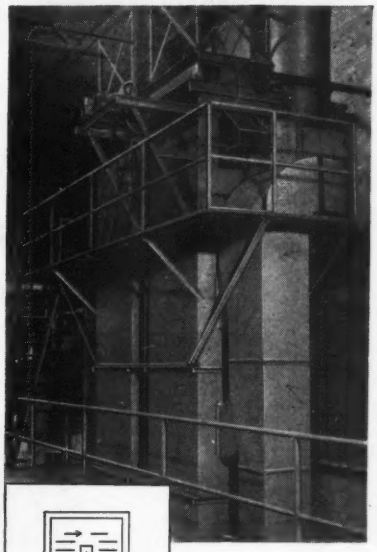

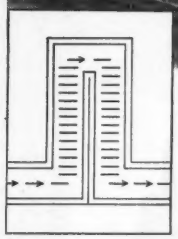

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For example, pictured above, an Olson Conveyor does double duty in building material plant. Roofing boards pass through a sequence of operations—first, coating, drying, second, coating, drying and cooling on a series of fully enclosed Olson horizontal and vertical conveyors—a completely automatic process. Ducts on either side of each unit keep hot air passing over the moving boards. Product emerges finished.

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Electric Industrial Truck and Tractor Specialists Since 1917

TRENDS IN FRICTION MATERIALS . . .

(Continued from page 30)

tive field and have been used with marked success in industry. Development of units for specific applications in material handling equipment are receiving careful consideration. There are many advantages to the method of using power, which at an early date will undoubtedly become a definite factor in material handling equipment.

We must not overlook the steady growth of the fluid drive principle. This method has gained wide acceptance, and future possibilities for both clutch and even brake function will have a very definite effect on design fundamentals.

What of Bonded Friction Liners?

Let us now take a look at some of the facts regarding the highly publicized subject of bonding or fusing of friction liners to shoes, bands and discs. It was felt some years ago (about 1934) that a process such as this would offer distinct advantages to equipment using friction materials in any form.

This method would overcome many shortcomings that exist with present riveting methods. It would permit the use of more of the friction material, resulting in much longer lining life, sometimes well over 40% longer than the same riveted assembly. It would greatly reduce drum scoring by the elimination of rivet holes which collect abrasive dust and are the focal point of all scoring, and give increased performance characteristics by elimination of champer on liners.

With these primary facts before them development programs were instigated by several automotive manufacturers as well as friction material manufacturers. Considerable momentum was gained by several organizations, and testing programs were conducted and experimental methods tried out on a limited scale. Most of these tests were far from conclusive, but they were steps in the right direction. They

promised to lead to a final solution of the problem.

The war interrupted this program insofar as normal applications were concerned, but during the war improvements in cements and processes were brought about by the intensive research that was conducted on war materials.

The program was reopened after the war and was rapidly brought to the stage where at least two major automotive manufacturers adopted the principle as standard equipment. Many smaller concerns, including both industrial and material handling manufacturers, have been conducting extensive research programs with a view toward possible use as a solution to many of their individual problems.

This method of application is also being used with continued success in the replacement of liners now applied by the riveting process. Again, this is primarily in the automotive field.

Process With Resinous Compounds

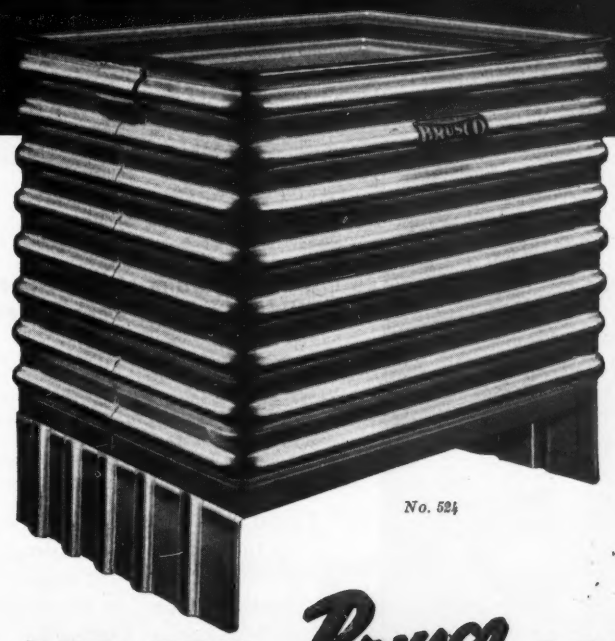
The process consists of the use of a thermo-setting resin that is applied between the friction liner and the surface to which it is to be mounted, then, by the application of heat and pressure for a pre-determined period of time, a vulcanizing occurs. There are several methods of applying both the resinous compounds and the heat and pressure to complete the cycle.

Caution must be used, particularly in the application of heat and the length of this cycle. If the temperatures are too high for too long a period of time it is possible to ruin a brake liner, or at least seriously damage its friction characteristics.

This process is too new to predict its final place in the over-all picture. There is, however, every reason to believe that it is here to stay and will gain wide usage, as both engineers and users begin to recognize the distinct advantages offered.

Special equipment is always required to give a satisfactory installation. Applications should not be attempted without such equipment, and then only by someone thoroughly familiar with all details.

HERE'S A REAL PARTS BOX BUY!



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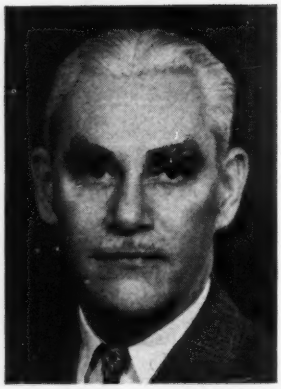


By FRED A. MILLER,
Group Supervisor,
Materials Handling Consultants
E. I. Du Pont de Nemours & Co., Inc.
Wilmington, Del.

Condensed from a paper presented to the Materials Handling Society of Philadelphia.

The crane stacker incorporates "basic fork truck elements which have been taken and suspended from the ceiling".

THE so-called stacker crane, which I wish to discuss, is an entirely new facility for material handling. We called it a stacker crane because the stacking feature of the fork truck was simply attached to the trolley of an overhead bridge crane. It was developed in the du Pont Engineering Department to maintain maximum storage capacity and, at the same time, achieve the economies made possible by the fork truck and pallet system.

Our findings for maintaining minimum aisle widths resulted in the theory that the mechanism must of necessity be suspended from above. So we devised and developed an overhead supported rigid mast (Figure 2) with a pick-up to improve space utilization by reducing aisle widths required. The mast is attached to the trolley of a conventional overhead bridge crane. The rigid mast is secured to a turntable built into the bed of the trolley. A hoisting carriage with any type load-engaging device completes the development. In effect, the basic fork truck elements have been taken and suspended from the ceiling, eliminating the counterweight in the process. The pick-up stacking unit can be transferred from one crane to another,

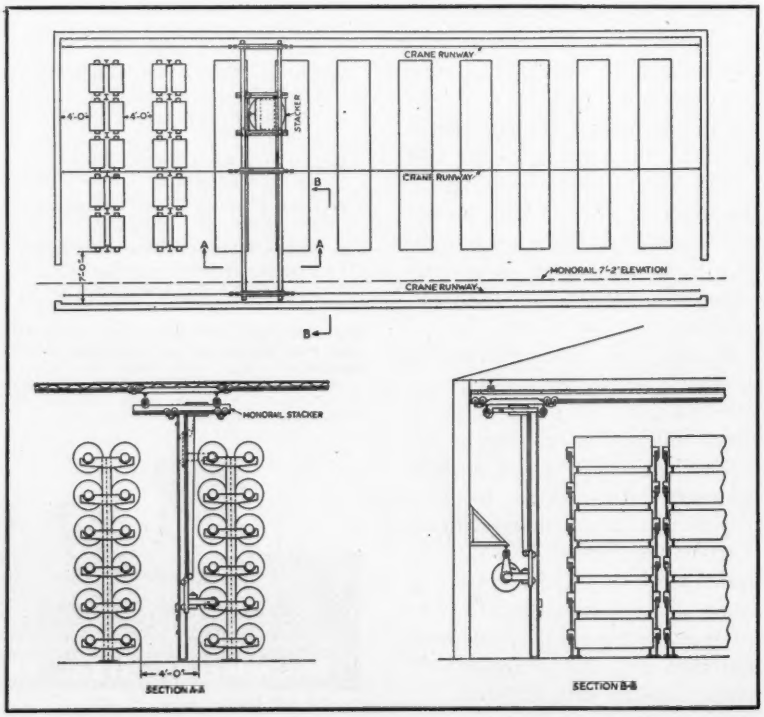


Figure 1—Layout of storage area with sectional views. Figure 3 shows transfer in B-B.

or by a jib arrangement carry loads to and from the door of a box car or a truck.

This mechanical arrangement makes possible the maximum accessible storage capacity for a given area. The operating aisle width required is approximately the length of the load plus 18 in. In the case of a 4 ft. pallet, the aisle required is therefore 5 ft. 6 in.

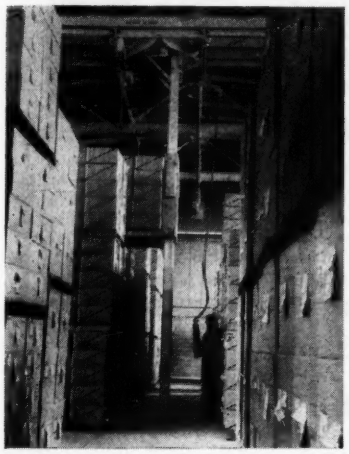


Figure 2—Overhead supported rigid mast with a pickup for operation in a narrow aisle.

To date, 14 stacker crane installations are in operation or will be completed in the next few months. The units employed are shown in the tabulation on the next page.

All of the installations shown are or will be in du Pont plants except the last one noted.

The two stacker cranes (Figure 1) listed in the first item were installed in the new cellophane plant for storing 1000 lb. rolls on the basis of lower investment cost as compared with any previous system operating in older plants. A subsequent check of cost sheets

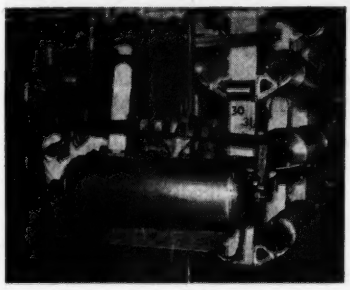


Figure 3—Transfer from monorail carrier to stacker crane. It is sketched in B-B, Fig. 1.

"Walking Away" WITH 96 BLOCKS

All in the Day's Work for this WISCONSIN POWERED UNIT

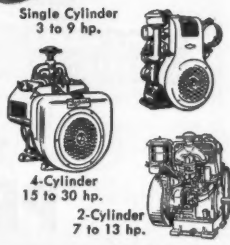
This Lewis-Shepard fork truck, made by Lewis-Shepard Products, Inc., Watertown, Mass., illustrates a typical heavy-duty material handling application.

Handling heavy loads of concrete blocks with a fork truck calls for husky, dependable power . . . the kind delivered by the Wisconsin Heavy-Duty Air-Cooled Engine that "teams up" with this Lewis-Shepard unit. The net result is MORE WORK with LESS MAN HOURS and *minimum maintenance costs.*

Regardless of the field or application, you'll find Wisconsin Engines enthusiastically endorsed by everyone along the line . . . builders, sellers, and users of heavy-duty power equipment, 3 to 30 hp. . . . because of such features as thrust-absorbing Tapered Roller Bearings at both ends of the crankshaft . . . high-tension, rotary-type OUTSIDE Magneto with Impulse Coupling for quick any-season starting and running, plus trouble-free Air-Cooling.

4-cycle, single-cylinder, 2-cylinder, and V-type, 4-cylinder models, 3 to 30 hp. Specify WISCONSIN POWER for your equipment.

Single Cylinder 3 to 9 hp.



4-Cylinder 15 to 30 hp.

2-Cylinder 7 to 13 hp.

MOST H.P. HOURS

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World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

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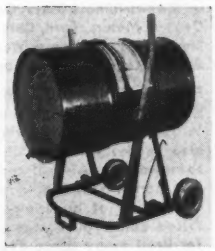
The Answer To Your Drum Handling Problems

They're Easy Tilting

The PENCO PORTABLE DRUM RACK serves as a barrel hand truck, will tilt drum EASILY with perfect control, and can be replaced upright, or it may be locked in any desired position. It reduces fire hazards, avoids loss of materials and reduces accidents.

The PENCO PORTABLE DRUM RACK is light weight yet ruggedly built. Operator uses a minimum of effort for drums weighing over a quarter ton. The center of gravity is over wheels allowing proper distribution of weight on handles with safety.



FREE Illustrated Bulletin on PENCO PORTABLE and STATIONARY DRUM RACKS Available. Write today.

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SIMPLE — SAFE — SPEEDY MATERIAL HANDLING

Step-Up

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50% with

ROURA

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HOPPERS

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Handling wet or dry, hot or cold, bulky materials quickly and easily, the ROURA is simple to operate—only one man is required for distributing and unloading—and he does this in much less time than ordinarily required under old-fashioned manual methods. Thousands of Roura Hoppers (which fit any standard fork or platform lift truck) are in constant daily operation, serving and saving for such firms as Owens-Illinois Glass, Corning Glass, National Fireproofing, General Motors, Ford, Chrysler, American Brake Shoe, General Electric, Westinghouse, Western Electric, American Steel Foundries, International Harvester, John Deere, etc.

By a simple lift of the exclusive release handle, the ROURA HOPPER dumps, rights and locks itself securely. Sizes—½, ¾, 1, 1½ and 2 cubic yards; the ROURA HOPPER can also be designed for flat trucks and in other sizes to meet specifications. Also, it can be equipped with special flanges that permit stacking to desired tiers for storage or future distribution of materials—conserving valuable floor space. Priced below all competition, the ROURA will quickly pay for itself many times over.

Write today for detailed brochure.
"You Can Save 50% Labor-Time"

ROURA IRON WORKS, Inc.
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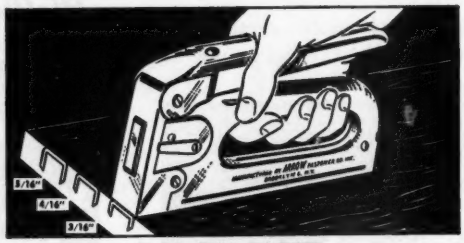
STAPLE — to save time — speed up production



T-32 GUN TACKER

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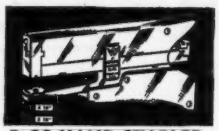

P-22 HAND STAPLER

"Reaches into hard-to-get-at places." Ideal for tagging, labeling, wrappings, sealing bags, containers, etc. Same machine takes 1/4" and 5/16" staples. Loads 150 staples. $6.00.

105 STANDARD

Stapler, Tacker and Plier. Temporary and permanent stitch. All steel with chrome finish. Fastens up to 40 sheets of paper and loads 105 standard staples. $3.50.

Slightly higher in the West and Canada
Buy from your local dealer or order direct—Dept. F

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60 SECONDS AFTER IT'S APPLIED YOU CAN TRUCK 50,000 LBS. OVER IT!

No need to slow production when floors need repair. Use Swift-Floor. After just 60 seconds, you can put your floor to work. Swift-Floor will support loads of more than 25 tons. It's skid-proof, fireproof, resilient, and self-sealing. Swift-Floor will make your broken floors look like new.

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It's pre-mixed and ready to use. Any workman can apply it. Just prime, fill, and tamp.

GUARANTEED!

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THE MONROE COMPANY, INC.
10710 QUEBEC AVENUE • CLEVELAND 6, OHIO

showed that the new system was handling 1000 lb. rolls at a savings of 60% as compared with the performance of the next best system. The two cranes listed as Item 3 were installed during a subsequent plant expansion after several years of satisfactory operation of the original pair. The roll handling cranes listed as Item 5 were installed in another cellophane plant on the same basis. These results are accomplished by the fact that all necessary motions for storing rolls are motorized and operate by pushbutton from a single level. The only difference incorporated in these cranes was the substitution of a motorized roll core engaging mechanism on the lifting carriage in place of the usual fork pick-ups (Figure 3). It should be noted that rolls are stored to a height of 14 ft. with perfect safety (Figure 4). Since all major motions are pushbutton actuated, it is possbile to use female operators.

STACKER CRANES IN SERVICE OR BEING INSTALLED

	No.	Capacity	Type of Service
Item #1	2	1000 lb.	storing rolls
Item #2	1	3000 lb.	storing pallet loads
Item #3	2	1000 lb.	storing rolls
Item #4	1	4000 lb.	storing skid loads
Item #5	2	1000 lb.	storing rolls
Item #6	1	1000 lb.	storing pallet loads
Item #7	2	500 lb.	storing drums
Item #8	3	3000 lb.	storing pallet loads
	14	Total	

The stacker crane shown in Figure 2 is Item 2. It is in operation in a yarn plant and was justified on the basis of increasing storage capacity in an existing building by 58%.

The stacking crane noted for storing 4000 lb. skid loads of finished products was approved on the basis of eliminating the need for doubling the size of the shipping area, which would have amounted to approximately 200,000 cu. ft. of additional building construction. The increase in storage capacity was gained by storing the skid loads two high; the upper layer by stacker crane on steel racks, and operating in the same aisle width, about 6 ft., as required with the hand jack truck operation for plac-

Figure 4—Cellophane rolls weighing 1000 lb. are stored to a height of 14 ft. with safety.

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• WAREHOUSING • FINISHING
• PRODUCTION • RECEIVING
• INSPECTION • SHIPPING
• STORAGE

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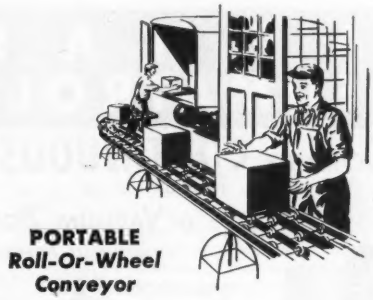
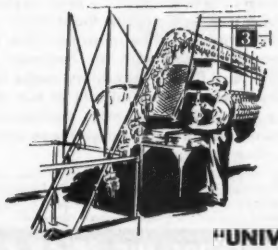
WHEREVER materials are moved, in packages, cartons, barrels, boxes, bags or in bulk, Buschman Conveyors are at work. In your plant, from receiving room to shipping, whatever the job, there's a Buschman Conveyor to fit your particular requirements.

Whatever your problem . . . simple or complex . . . bring it first to Buschman, for a practical solution. Write for General Catalog No. 400.



PORTABLE Roll-Or-Wheel Conveyor

"TROJAN" Portable Belt Conveyor



"UNIVERSAL" Or Special Cable Trolley Conveyor

Buschman Conveyors

THE E. W. BUSCHMAN CO., INC.
4450 Clifton Avenue
Cincinnati 32, Ohio

ing the lower layer. As the maximum loads approached 4000 lb. (Figure 5), all motions including the rotation of the mast were motorized and controlled by a

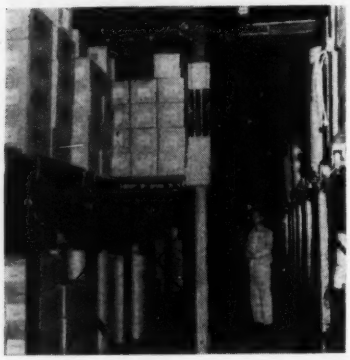


Figure 5—Skid loads are stacked two high on steel racks. All motions are motorized.

pushbutton station at floor level. This operation is not one of storage alone; a high-turnover shipping proposition of more than several hundred units per day is involved in this case.

Item 6 was installed in a modernization program at one of our Photo Products plants, where it more than doubled the storage capacity in one of the existing buildings (Figure 6). Note that the stacker crane used in this case has a rigid non-rotating mast and that the pick-up carriage is rotated at any elevation to the desired direction for storing the load in multi-deck steel racks.

The new du Pont Experimental Station buildings near Wilmington include solvent drum storage, where any one of 500 drums must be available without shifting others. Du Pont materials handling consultants recommended special storage racks and a stacker crane. Here again the stacker crane proved to be the most economical medium for efficient selective storage. A sizable reduction was also effected to the accompanying ventilating system necessary to remove hazardous solvent vapor from the building.

The lack of explosion-proof truck equipment is recognized and has prevented consideration for mechanizing the handling operations in all such areas.

Both the storage and dispensing area stacker cranes shown in Item 7 are of explosion-proof construc-

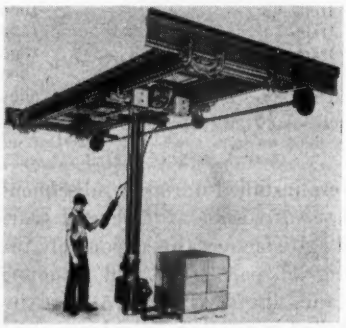


Figure 6—Monorail stacker crane for photo products has rigid mast with rotating pickup.

tion, as all motors, controllers, cable reels, and electric wiring meet the National Board of Fire Underwriters' specification of Class I Group D. Therefore, this

HAPMAN PNEUMATROLS

Now CONVEY CONTINUOUSLY
INTO OR OUT OF
PRESSURE or VACUUM ZONES
WITHOUT PULSATION

HANDLE ANY FLOWABLE MATERIAL

This photo shows the testing set-up prior to shipping an installation of a Hapman circular flight chain conveyor equipped with Hapman Pneumatrols. The pressure-sealed Pneumatrols used with the Hapman pressure-tight, chain-link and flight assemblies, make it possible to convey any flowable material into or out of vacuum and pressure zones intermittently, continuously or it can be processed in motion through these zones. Complete information on request.

A. Motor and drive. B. Speed reducer. C. Dotted lines indicate position of pressurized hopper in actual installation. D. Tanks supplied air source for actuating Pneumatrols in test set-up. E. Receiving hopper. F. Standard take-up for Hapman chain conveyor.

HAPMAN CONVEYORS, INC. 2405-E W. McNichols Road Detroit 21, Michigan

NEW MILSCO SEATS
FOR HEAVY DUTY MOBILE EQUIPMENT

Many Features
Greater Economy

MILSCO Commander

The Milsco seats illustrated are typical of the standard Milsco line for various types of mobile equipment. New features combine extra comfort and serviceability. Sturdy metal frames; Foam Rubber padding with a choice of durable covering materials; easy installation.

MILSCO FOLDING BACK REST

If your equipment requires special seating, our Engineering Department will gladly work with you. Put our years of specialized seating experience to work . . . without obligation.

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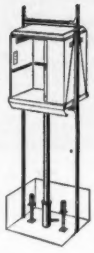
Rota-Flow eliminates vibration and "pumping" noise and operates with greater efficiency than any other hydraulic power unit. Automatic floor-leveling within ¼" guaranteed, regardless of load or rate of speed.



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Call on Rotary's coast-to-coast field organization to help you with your elevator plans. For catalog and specifications, write Rotary Lift Co., 1139 Kentucky, Memphis, Tennessee.

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PASSENGER AND FREIGHT

feature of the stacker crane should be particularly interesting to engineers in those industries where mechanization of handling operations has been restricted by the presence of highly combustible materials. With the stacker crane, palletized and other forms of unit load storage are entirely feasible. Flow of materials to and from the hazardous area can be handled by conveyors or by hand lift trucks.

The three stacker cranes noted in the last Item of the tabulation have been purchased by a large company other than du Pont. They will be employed in a selective storage service to stack jet engines on pallets in steel racks. Here again better space utilization more than justified the cost of the installations.

Although the rigid mast stacker may be mounted on any type of overhead crane or double monorail carrier, the existing installations have been made on underslung monorail cranes equipped with rubber tire traction drive units. This drive is most desirable for warehousing operations. The stacker crane operates with safety when working at elevated heights. Its stability is not dependent on floor conditions.

The overhead clearance for runway, crane, and stacker unit will range from 21 to 47 in. depending on capacity and span. This distance is normally required for spread of sprinkler heads and diffusion of the lighting and therefore little, if any, additional building cost is involved. However, in special cases additional height may be required.

I wish to emphasize the fact the stacker crane does not replace a fork truck storage operation where material can be stowed away in large solid blocks with minimum aisle access.

FLOW DIRECTORY

Copies of the new and revised Directory are available at $5 each. An invaluable manual for the material handling engineer, production executive, and purchasing agent.

One Man Air Hoist

If you're thinking about a portable hoist as a burden-lifter in your plant . . . consider the Keller . . . it offers so many exclusive advantages.

This one-man hoist is a "joy to work with" says the Aluminum Company of America. In fact, it is acclaimed by management and men in factories, shipping departments, tool rooms, foundries . . . wherever it is used on lifting and lowering jobs.

Here are some of the reasons for its popularity:

It is so light in weight compared to other hoists of similar capacities . . . that one man can carry it, set it up and use it . . . without strain or injury. Just attach to air line and it goes to work.

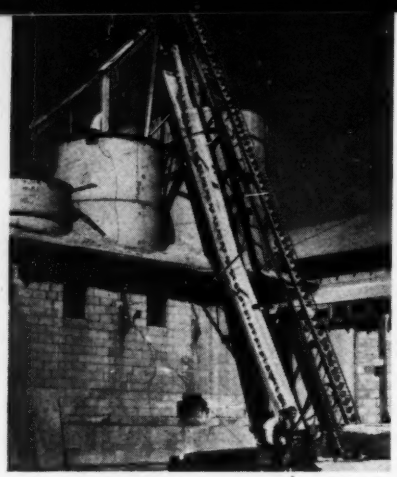
Then, it has a fast lifting speed. 17 Feet per minute at full load for the 500, 1000, and 2000-lb models. For 300-lb model, 75 feet per minute. Speed can be varied at will by the operator from creep to full capacity for either lifting or lowering.

Naturally, when you install a hoist you expect to increase productive effort and slice operating cost. The Keller accomplishes both objectives . . . conserves worker's energy, mechanically speeds his efforts; saves lifting and lowering time. Provides maximum power with minimum air consumption. Hoist is so durably built as to set all time low cost records for maintenance.

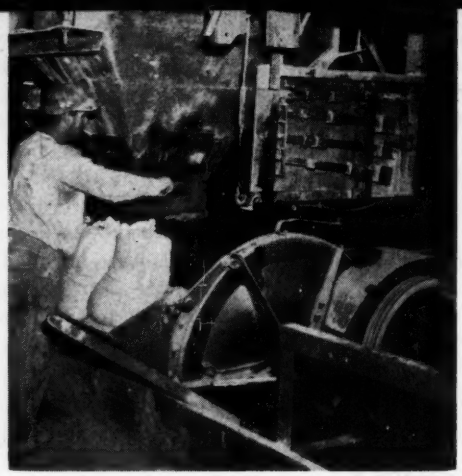
You will find numerous reasons for considering the Keller One-Man Hoist in an illustrated folder which we invite you to send for . . . now.

Keller Air Hoists are serviced and sold through our branch offices throughout the United States or direct from the factory.

KELLER
Pneumatic Tools
KELLER TOOL CO., GRAND HAVEN, MICH.

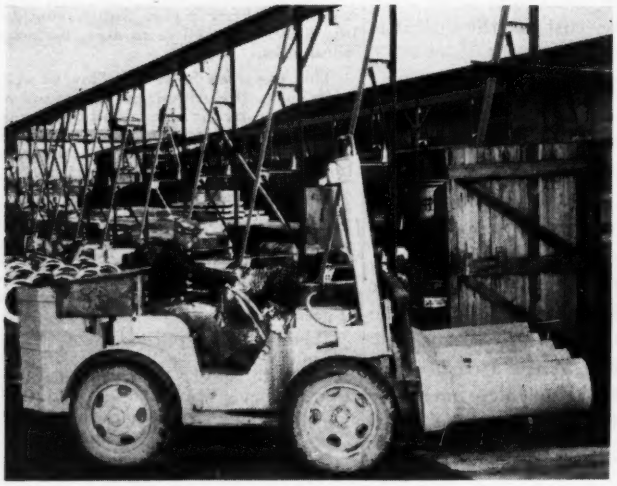


1 A BUCKET ELEVATOR transports gravel and sand from a pit to a series of chutes which feed one of three storage bins where . .



2 A 3000-LB. CAPACITY track-mounted weigh-larry receives material from the bins and feeds one of the mixers. Next . . .

3 THE CONCRETE MIX is elevated from mixer by skip hoist which discharges into pipe machine hopper. Then . . . .



6 MULTI-TINED FORK eliminates a laborious manual job by handling four pipes from the kilns to yard. Also . . . .

7 A TRACTOR, MODIFIED with a hydraulic boom and special lifting rig moves four medium-size pipes. In addition . . .

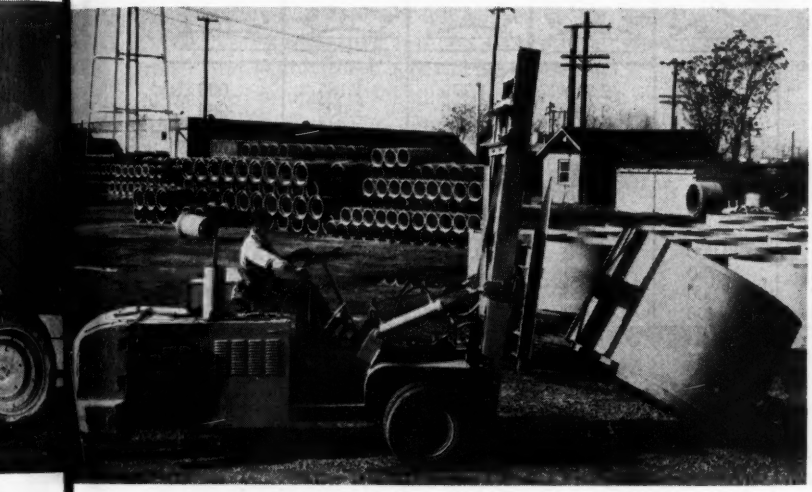
Fragile Heavyweights Handled W

A MAJOR problem in the concrete pipe industry is the safe handling of large cumbersome shapes which, despite their extreme weight, are susceptible to breakage. The Universal Concrete Pipe Co., Columbus, Ohio, offers a good example of the increasing mechanization which has taken place in this industry in recent years —a trend which has not only contributed to greater unit production per manhour but has also made possible a safer operation, both for personnel and product. Universal produces more concrete sewer and culvert pipe than any other company in the world. This photo report on its Columbus plant, one of 17 it owns in the East and South, is the largest with regard to output. Individual pipes range in length from three to eight ft., inside-diameters from four ins. to 10 ft. Some individual pipes weigh as much as eight tons.

This progressive photo series highlights some of the major factors which illustrate the new trend in this industry. 1. The company's modern pipe manufacturing equipment is matched by high-capacity handling machines. Example: A 12″ pipe is turned every 30 to 45 seconds, a 72″ pipe in two to three minutes. 2. Fork trucks aid processing operations; they also take the "strain" off the job by performing such tasks as kiln unloading. 3. Standard equipment, such as tractors and fork trucks, have been modified in order to accomplish such yard opera-

4 A 12,000-LB. CAPACITY fork truck transfers a filled pipe form to a kiln. Men moved these forms. Other . . . .

5 IN-PLANT OPERATIONS are performed with an off-bearing buggy for smaller forms to kilns. At this station . . . .



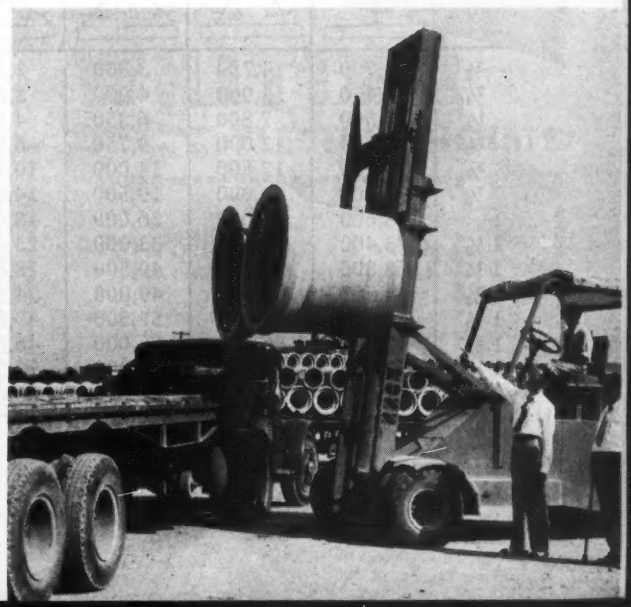
8 ANOTHER LABORIOUS job is eliminated by a fork truck which safely flips 72-in. pipe horizontally. In another area . . .

9 PIPE OVER 72 INS. is cast under the span of a five-ton bridge crane which also does loading. In the yard . . . (see below)

d With Care

tions as stacking and tiering. 4. Material handling machines make workers skilled operators instead of menial laborers. 5. A storage yard of some 500,000 sq. ft. gives adequate storage capacity.

Pneumatic-tired handling machines perform the major part of the overall job, from the pipe machines to the highway trailers and rail cars which deliver the finished product. Steel strapping is often used for securing the loads on the outgoing carriers.



10 FORK TRUCKS, whose pneumatic tires are designed for rough terrain, make a heretofore difficult loading task an easy one-man operation.

FLOW ENGINEERING DATA PAGE

A regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

(From the 1949-50 FLOW Directory of Material Handling Equipment, Machinery and Accessories)

SAFE WORKING LOADS FOR ALLOY SLING CHAINS

In Pounds with Branches at Various Angles. These Safe Working Loads are based on 62½% of Proof Test

SIZE OF CHAIN	SINGLE SLING CHAIN	DOUBLE SLING CHAIN WHEN USED AT 60° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 45° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 30° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 20° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 15° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 10° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 5° ANGLE
9/32"	3,425	5,935	4,845	3,425	2,340	1,775	1,185	600
5/16"	5,500	9,525	7,775	5,500	3,760	2,840	1,905	960
3/8"	8,250	14,290	11,665	8,250	5,645	4,275	2,860	1,445
7/16"	11,000	19,050	15,555	11,000	7,525	5,695	3,815	1,925
1/2"	14,000	24,250	19,800	14,000	9,575	7,250	4,855	2,450
9/16"	17,150	29,700	24,250	17,150	11,730	8,885	5,950	3,000
5/8"	20,600	35,680	29,130	20,600	14,090	10,670	7,150	3,600
3/4"	28,750	49,800	40,655	28,750	19,665	14,895	9,970	5,035
7/8"	36,000	62,350	50,900	36,000	24,625	18,645	12,490	6,300
1"	48,400	83,830	68,440	48,400	33,100	25,070	16,795	8,470

SAFE WORKING LOADS FOR WROUGHT IRON SLING CHAINS (In Pounds)

SIZE OF CHAIN	SINGLE SLING CHAIN	DOUBLE SLING CHAIN WHEN USED AT 60° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 45° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 30° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 20° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 15° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 10° ANGLE	DOUBLE SLING CHAIN WHEN USED AT 5° ANGLE
3/8"	2,700	4,700	3,800	2,700	1,850	1,450	940	470
7/16"	3,450	5,900	4,900	3,450	2,350	1,750	1,200	600
1/2"	4,500	7,800	6,350	4,500	3,100	2,300	1,570	780
5/8"	6,900	12,000	9,750	6,900	4,700	3,550	2,400	1,200
3/4"	10,100	17,500	14,000	10,100	6,900	5,200	3,500	1,750
7/8"	14,000	24,000	19,500	14,000	9,600	7,250	4,900	2,400
1"	18,600	32,000	26,000	18,600	12,700	9,650	6,500	3,200
1 1/8"	23,400	40,000	33,000	23,400	16,000	12,000	8,000	4,000
1 1/4"	28,800	50,000	40,500	28,800	19,700	15,000	10,000	5,000
1 3/8"	34,500	60,000	49,000	34,500	23,500	17,800	12,000	6,000
1 1/2"	40,800	70,000	57,500	40,800	28,000	21,000	14,000	7,000
1 5/8"	46,500	80,000	66,000	46,500	31,800	24,000	16,000	8,000
1 3/4"	52,500	91,000	74,000	52,500	36,000	27,000	18,000	9,100
2"	66,600	115,000	94,000	66,600	45,600	34,500	23,000	11,500

NEWS FROM THE SALES FIELD

THE RAPIDS STANDARD CO., Grand Rapids, Mich., has announced the opening of a factory sales office at 2036 E. 22nd St., Cleveland. This is one of four such offices in major cities. The outlet will carry the company's entire line of gravity and powered conveyors and hand trucks. It will handle engineering and installation of this equipment in the northeastern Ohio area. Larry Hillis is in charge of the Cleveland office.

MORRISON CO., 4119 Prospect Ave., Cleveland: it has announced that it is now carrying the complete line of powered belt and gravity conveyors manufactured by Arrow Products, Inc., Grand Rapids, Mich. The gravity line includes steel and aluminum roller and skate wheel types. The Morrison Co. has specialized in material handling systems for 21 years, and has its own engineering department for special layouts and designs, and also maintains a completely equipped service department, manned by factory-trained service personnel.

TURBO-TRIMMERS
CONVEYALL LOADERS
MOTO-TRIMMERS
BIN-VEYORS
BUCKET TYPE Elevator
LOOK to Bosworth
FOR LEADERSHIP IN THE SELF-POWERED LOADING AND CONVEYING FIELD! The Bosworth Line of Conveying and Loading Equipment is complete in every detail. If you believe in progressive, modern business then look to Bosworth.
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WHY USE SLOW, COSTLY MUSCLES
WHEN A HALF-TON WHITING ELECTRIC HOIST IS ONLY...
$168.00 AND UP
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You can lift heavy loads 13 times as fast with a Whiting electric hoist as you can with a hand hoist. Skilled workers and expensive machines can be released for productive work, and usually, the Whiting hoist will pay for itself in a very few months.
Workers are enthusiastic about Whiting hoists, too, as they eliminate the danger of rupture and strained muscles.
Whiting hoists have a unique, double worm-gear drive that provides smooth, silent power and makes possible amazing simplicity. They will last longer because they have fewer wearing parts than any electric chain hoist.
PAYS FOR ITSELF in a Few Months!

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Builders of Cranes, Monorail Systems and ELECTRIC HOISTS

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☐ Send me a copy of your Bulletin H-100B.
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STREET ADDRESS
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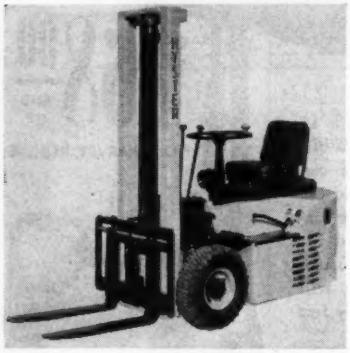
NEW PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

2000-LB. LIFT TRUCK

NP1—A 2000 lb. capacity lift truck (Model 20) has been introduced by the Hyster Co. Smallest in the company's line of seven industrial trucks, the machine is powered by an air-cooled engine. Engine features include a new intake manifold; re-design of shrouds to pull air from the sides of the machine; and an electric fuel pump.



Accessories of the power unit include an automotive-type battery; muffler with spark-arresting features; and a large gasoline tank which is designed for continuous eight-hour duty without refilling. The clutch has pedal pressure comparable to that of a passenger automobile clutch. Tilt control of the uprights is accomplished through double-acting hydraulic cylinders for both directions of tilt. The truck has lug-type pneumatic tires.

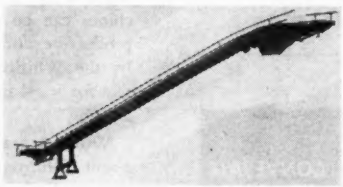
FLOOR LOCK

NP2—An arc-welded steel floor lock for portable elevators, conveyors, floor trucks and other portable equipment

has been announced by The Rapids-Standard Co. Three standard models were designed to match Rapistan casters #3335, #15, and #266 in extended overall height, bolt hole spacing, and top plate dimensions. Weight varies from 2¾ to six lb., and extended heights from 4 13/16 to 7¾ ins., depending on the model. The lock features a leaf-type treadle for instant, positive locking and release action. Rough-top belting securely riveted to the bottom of the floor plate insures a non-marring, sure grip on all types of surfaces, it is stated.

BELT CONVEYOR

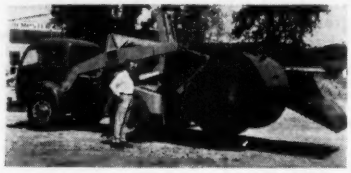
NP3—The Standard Conveyor Co. has developed a model for elevating and lowering boxes, cartons and sacks between the basement and first floor or for horizontal use. A rod control at the



side of the machine provides easy starting or stopping from top or bottom. The units have an all-steel frame. Those up to 15′ 6″ long are shipped completely set up; units 18′ to 30′ 6″ long are shipped in two or three pieces. Two types, with or without gooseneck, are offered in four standard belt widths, 10″, 14″, 20″ and 24″.

WATER-TIGHT RUBBISH CONTAINER

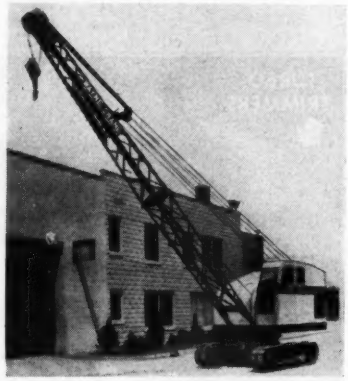
NP4—An eight-cu.-yd. composite container, featuring a large capacity and water-tightness, has been added to the line of Dempster-Dumpster bulk ma-



terials handling equipment, manufactured by Dempster Brothers, Inc. Liquids seeping down through wet rubbish are caught in the container's water-tight bottom. Rubbish is dumped through one of the doors located in the sides of the container, which is automatically tilted into dumping position. In the complete operation the Dempster-Dumpster hoisting unit picks up a pre-loaded container, transports it for dumping at the disposal area, then returns it. All operations are controlled entirely by hydraulic controls in the cab of the hoisting unit. One truck and the driver service any number of the containers.

CRAWLER-MOUNTED CRANE

NP5—A 7½-ton, crawler-mounted industrial crane, Model 66, has been announced by the Wayne Crane Division of American Steel Dredge Co. The model weighs 27,908 lb. and is convertible to a magnet, ½-yd. dragline, clamshell, shovel or trench hoe. The new crawler assembly is powered through direct drive propeller snaft assembly. The transmission is remotely located

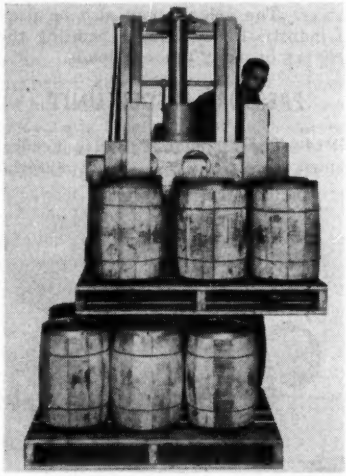


from the power unit and is connected by a right angle drive and universal drive shaft. Bearings mounted on the outside of the drive sprocket are said to minimize bending stress on the travel shaft. The bearing length of the crawler is 8′ 5″ with a width of 8 ft. which facilitates 360° operation. Self-cleaning, nonclogging treads can be used with grousers. The upper works of the Model 66 is enclosed in a weatherproof, inside bolted cab which permits inside access to all deck machinery. Other features include either a worm-driven or live boom hoist; unit replacement of all subassemblies; built-in counterweight; 15-in. diameter drums; and anti-friction bearings throughout. The new model has an all-welded chassis and travels, lifts, booms and swings simultaneously or independently. The swing speed is 6.2 r.p.m. Standard power unit for the

crane is a six-cylinder gasoline engine which develops 62 h.p. at 1800 r.p.m.

YALE SIDE-SHIFTER

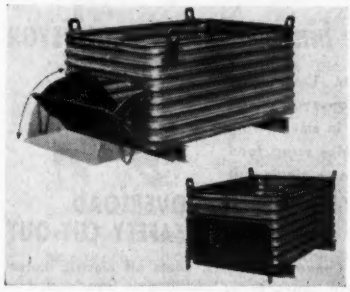
NP6—The Yale & Towne Mfg. Co. has developed a hydraulically operated side-shifter attachment designed for use with both the Lift King and Worksaver fork trucks. The device shifts the forks as much as four ins. to the right or left of center. This increased flexibility saves storage space by making it pos-



sible to spot loads in odd corners, close to walls, near pillars, or in other confined transfer and storage areas. A side-shifter when moved to either limit permits utilization of more than 11 additional cu. ft. of space when a single stack of 40″-long pallets is being tiered to a height of 10′. The side-shifter also eliminates manual positioning in trailer trucks and freight cars. The attachment is easily removed from fork trucks to permit installation of such accessories as drum handlers, pushers, rotators, keg handlers, clamps or other accessories.

STACKING BOX WITH HINGED DOOR

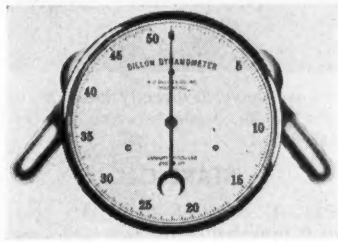
NP7—A corrugated steel stacking box with a chain operated hinged door has been announced by Palmer-Shile Co. One use for the box is on a steel stand. The door may be opened to any set



angle by means of the chain, simplifying parts disposal by standing or sitting workmen. The boxes are built to specified dimensions, load capacity and underneath clearance. Crane lugs, stacking brackets, and color of paint desired may also be specified.

"HEAVY" TESTING DEVICES

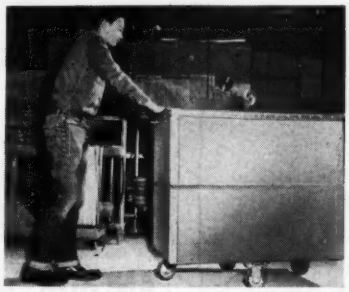
NP8—W. C. Dillon & Co., Inc. has developed a new addition to its line of precision testing devices—30,000, 40,000 and 50,000-lb. capacity traction type Dynamometers. The units are



used for checking draw-bar pull, weight of bulky objects, tension in ropes or cables, and static loads. The dial diameter of the new models are 10 ins; net weight is 25 lb. including shackles; the dial has etched figures with a satin silver finish which is said not to be affected by heat or fumes. Dial divisions are as follows: 0-30,000 lb. and 0-40,000 lb. models, 200 lb. divisions; 0-50,000 lb. model, 250 lb. divisions. These are all readable to ½ division. The shackles are 2″ x 3⅞″, and are designed to fit most standard hoist hooks whenever the devices are suspended for weighing heavy loads.

BOX-TYPE TRUCK

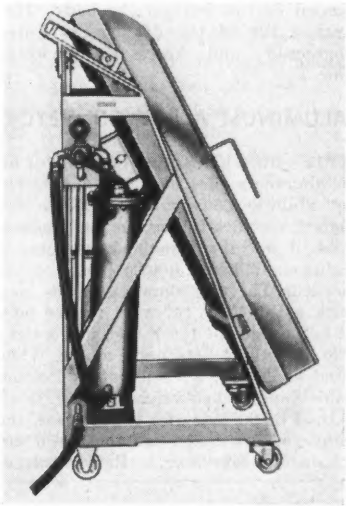
NP9—An all-aluminum lightweight box-type truck has been introduced by Tobey Mfg. Corp. The truck pictured is 24″ by 48″ by 33″, and weighs 95 lb. The frame is manufactured from high-tensile strength aluminum alloy



angles. Panels are aluminum alloy sheet flush riveted so that all inside surfaces are smooth. According to the release, the all-aluminum construction makes these trucks non-magnetic and non-sparking, and they require no paint and will not rust, splinter or absorb odors. For special applications, such as the food industry, the trucks can be washed down and steam cleaned. When handling inflammables, the vehicle's non-sparking quality is a safety feature. It is further claimed that in the dyeing and printing industries, where the truck is apt to come into contact with acids, it will not corrode or deteriorate.

HYDRAULIC DUMPER

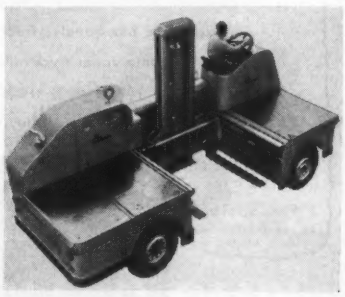
NP10—A large-capacity Hydraulic Materials Handler for dumping liquids or solids into high level kettles or tanks has been developed by the Lee Metal Products Co., Inc. The equipment is so designed that one man can empty a 500-lb. capacity barrel, or a 55-gallon drum in less than a minute. No power, other than water from the plant water main is required for operation. The



Handler is mounted on six-in. rubber-tired casters, and can be used to serve a battery of tanks or kettles. Five-hundred-lb. barrels can be set into the unit by a standard two-wheel truck. The lifter can also be fitted with a stainless steel trough and hopper into which dry or liquid products may be dumped and mixed before elevating.

SIDE-LOADING TRUCK

NP11—Designed for handling capacity loads of from 3000 to 30,000 lbs., this side-loading hydraulic Traveloader is being manufactured by the Lull Mfg. Co. The one-man operated vehicle may



be used in industrial plants, steel mills, storage depots, railroads, utilities and seaports. It lifts, loads, unloads, stacks and hauls steel, lumber, pipe, poles, spooled cable, from six to 66 ft. long. Side loading facilitates operation in

narrow aisles. In operation, a hydraulic lift-tower slides out 72 ins. to insert its forks under the load. The load is picked up by hydraulic power, and deposited on the platforms. Weight of the payload is distributed equally over two axles and all wheels, with minimum ground pressure on each tire. The unit carries loads at speeds up to 30 MPH. Unloading itself from the side, it needs no space for backing and turning, and it stacks to any height from ground level to a deck-stacking height of 12 ft. Two retracting hydraulic stabilizer jacks on the loading side are designed for handling of loads 12 ft. high, extended 64 ins. beyond the body. Hydraulic tilt of the lift tower is five degrees in or out. Accessories are available.

ALUMINUM ALLOY CONVEYOR

NP12—Bin-Phil, Sr., is the name of an all aluminum alloy conveyor announced by Phillips Conveyor Co. While designed specifically for use in handling coal, it may be employed wherever a lightweight high-capacity conveyor is needed. The unit shown is 20 ft. long with a three-ply 14"-wide rubber belt. It has a speed of 100 F.P.M. and weighs 220 lb. without detachable motor. When used as shown, a combination loading table and bracket weighing 35 lb. is attached to the side of a gondola car, the conveyor positioned and the motor engaged. An operator in the car places larger lumps on the loading table before pushing onto the belt. Smaller

sizes are shoveled directly into the conveyor trough. Models are available with cleated belts.

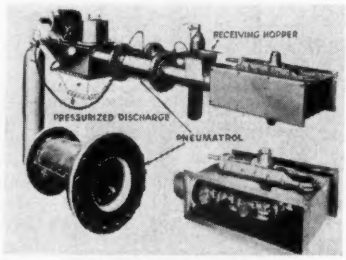
STAKE CAR

NP13—Economical light transportation is provided by the new three-wheel

Salsbury Stake Car. It has a 600-lb. load capacity in addition to the driver. It is manufactured by the Wayne Manufacturing Co. A 6.5 H.P. engine is coupled to an automatic transmission which gives ramp climbing ability as well as operating control without manual shifting. The load is cradled by transverse leaf springs to the independently sprung front wheels. The non-reversable worm-type steering gear is controlled by an automotive steering wheel. The coil spring rear suspension is designed for riding comfort for the driver. The vehicle may also be used in industrial plants for expediting the delivery of many types of loads.

PRESSURE FEEDER UNIT

NP14—The Hapman Pressure Feeder, shown, is designed to feed material

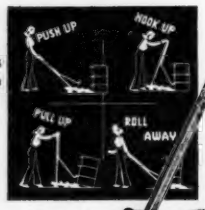


which is at atmospheric pressure into a zone which may be under pressure or vacuum. It is available from Hapman

"WATCH THE 'GEORGES'...GO BUY"*

"George," the almost automatic TOTE BOX TRUCK, is in operation to the extent of 175 units in one large company. YOU can prevent lifting casualties, speed movement, cut costs. Truck hook engages tote box handle; truck handle leverage glides box onto upper truck rollers, securely holds load; lower rollers carry truck to destination. Send for Bulletin... you'll buy too!

*With apologies to you know who



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Don't Fish For Small Parts!

ANCHOR "piano hinge" PAN TYPE CONVEYOR

Don't fish for small parts. The Anchor "piano hinge" Pan Type Conveyors won't lose an item under 5/32" in size. Giving trouble-free operation for chips, scrap, food and in-quench tanks. Built as a single unit in standard widths. Send for Bulletin 36-50.

OVERLOAD SAFETY CUT-OUT

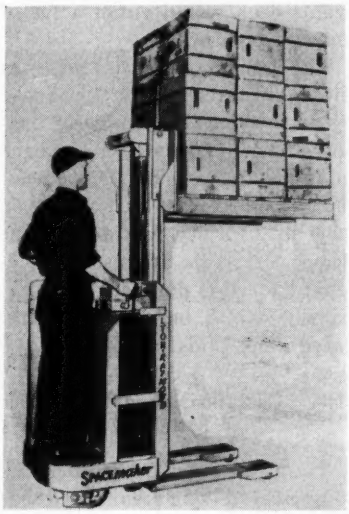
Sizes for all Conveyor systems. Shuts off electric motor instantly when conveyor or machine is overloaded—resets automatically. Write for Bulletin 44-51.

ANCHOR STEEL AND CONVEYOR CO.
6906 Kingsley Ave., Dearborn, Mich.

Conveyors, Inc. The Pneumatrols in this unit allow a differential in pressure between the receiving point and the discharge point. They act to divide the conveyor into two sections, an atmospheric section and a pressure or vacuum section, depending upon the individual requirements. The material may be fed into the receiving hopper continuously at atmospheric pressure. It is then conveyed through the Pneumatrol into the pressure or vacuum section of the conveyor and discharged into a container under the same pressure or vacuum. The Pneumatrol is shown in a cutaway view at the lower left of the photograph. Its inner sleeve is a flexible member usually fabricated of rubber and mounted so that an air-tight annular space is created between the inner sleeve and the outer steel casing. For material temperatures above the range of rubber, silastic can be used up to 450° F. Water cooled sections can be introduced above this range. Air or water pressure applied in the annular space will cause the inner sleeve to contract, producing a snug fit between the sleeve and the chain flights as they pass through the Pneumatrol.

"SPACE MAKER" TIERING TRUCK

NP15—Lyon-Raymond Corp. has developed an electric tiering truck which is designed to tier from narrow aisles and confined areas. The vehicle, known as The SpaceMaker, will tier 48" x 48" pallet loads at right angles from a six-ft. aisle, and 24" x 36" box skids from



a five-ft. aisle, according to the release. It is also designed for use on upper floors in multi-story buildings where floor and elevator capacities are limited. The vehicle is available in three different models, a platform type for tiering skids, a fork type for single-face pallets, and a straddle type for tiering two-faced pallets. Mail the post card bound into this issue for further information.

STACKING BOX

NP16—The style 600 stacking box manufactured by Bay Metal Products, is an all-purpose shop box with a rigid handle and hook hole at each end. Sturdy, all-welded construction. Heavy skids act as positive stacking lock and reinforcement at the points of maximum wear. It will tier with style 500 stacking bins of the same length and width.

COMPACT FLOOR SWEEPER

NP17—A vacuum-equipped power sweeper designed for high-speed industrial sweeping has been developed by the G. H. Tennant Co. Less than 29 ins. wide, the one-man-operated machine is said to have a sweeping capacity of over 43,500 sq. ft. per hour. A 24"-wide brush revolves inside a sealed-to-floor compartment, hurls dirt and litter into an enclosed built-in "floating" type hopper. At the same time a vacuum fan draws dust into a heavy fabric bag. The hopper automatically compensates for irregular floor surfaces and bulky debris. The sweeper has traveling speeds up to eight MPH in open areas and as low as two MPH for safe handling in narrow aisles and crowded areas. Use the postcard bound into this issue.

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MAGCOA Dockboards made of magnesium, the "miracle metal", can be handled by one man without the aid of truck, chain or hoist. They weigh less than a third as much as steel boards of comparable size and strength, and are reinforced like a bridge to carry extremely heavy loads. Their lighter weight speeds up loading and unloading operations . . . cuts down danger of hernia and mashed feet or hands. Non-sparking magnesium eliminates explosion hazard, too. Every MAGCOA Dockboard is designed to the particular requirements of your docks. Write us for further information.

If lightweight magnesium is applicable to any of your products, our facilities warrant your serious consideration.

Our Materials Handling Line Includes MAGCOA Hand Trucks, Barrel Skids and Grain Shovels

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WESTERN DIVISION—831 S. Flower Street, Los Angeles 14, Calif.

"DIFFERENT" OPERATION . . .
(Continued from page 27)

weather-tight tops in a receiving-storage area which has no truck dock. The drums weigh from 800 lbs. to 1500 lbs. each. The absence of a truck dock represents little difficulty since the receiving bay is covered by a pendant-controlled bridge crane of 2000 lb. capacity. It lifts the barrels from the delivery trucks and stacks them up to four high in the bay.

Visitors sometimes ask us why we do not palletize the steel drums at this point. There are two good reasons. 1. The 30′ x 50′ receiving area offers only limited storage capacity. With pallets, we could go only three high, whereas with the present method we can go four high. This means 30 per cent more storage. Storage capacity is also increased by the nesting feature of the drums in a lateral direction. 2. The nickel silver blanks are usually fed to the first operation (annealing furnaces) by the single drum load, and hence the detiering and restacking of load carriers with four drums each would entail a lot of unnecessary work.

The receiving room also serves as the loading area for scrap produced by the rolling and trimming machines. About 60 per cent goes back in drums, the remaining 40 per cent in bales. Both types are loaded by a 3000 lb. capacity fork truck. The drums of scrap are usually palletized for this purpose, while the baled scrap is handled on corrugated steel skids.

Hoist Operation. Hand-Truck-Skid System

The production department adjoins the receiving area. The drums of blanks are delivered one to a 24″ x 24″ steel skid, specially designed for this purpose. Usually the fork truck assigned to this task delivers two skidded units at a time. The point of delivery is a centralized area which is handy to the annealing furnaces.

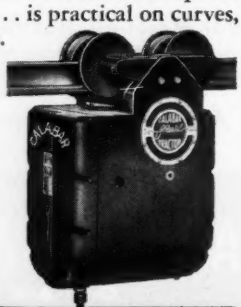
The handling method at the feed end of the annealing furnaces is shown in one of the photos. The open drum is placed in a hoist-suspended jig, which is then elevated by means of the electric hoist. At table height the barrel is tilted to discharge its contents on the racking table, ready for the racking operators. They insert the individual pieces in coiled wire racks, which are then placed on a slow-moving wire mesh belt that travels through the furnace.

Drum handling is well suited to the racking operation. The operators have the pieces on the table, whence they are quickly gathered in the desired quantities. They do not have to reach into a barrel and grasp; they merely slide the pieces off the pile. As the latter diminishes the stockman raises the barrel higher to discharge the drum completely.

Additional supplies of blanks are conveniently drawn from nearby zone storage by use of hydraulic hand lift trucks. Specially designed

LOADS UP TO 5 TONS ON HOISTS OR CRANES

HERE'S SMOOTH STARTING TRACTOR POWER for propelling hoists on monorails and cranes. The compact, efficient Calabar *fluid* Tractor starts slowly, smoothly, without jerking or swinging the load. It's applicable to flat or tapered track . . . travels at speeds ranging from 50 to 250 FPM . . . is practical on curves, inclines and awkward passages. Gears, bearings and all wearing parts are totally enclosed and operate in oil bath. End plates are removable. Control is by pendant push button. Two sizes available. Write for illustrated catalog.



CALABAR CORP.
8414 Otis Street, South Gate, Calif.

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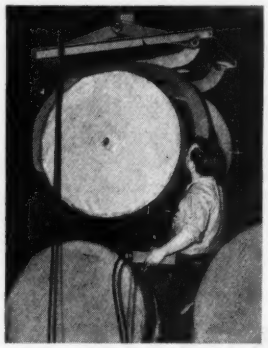

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"and it permits us to store and handle a large volume of paper in a small area, releasing valuable space for productive equipment." That's why

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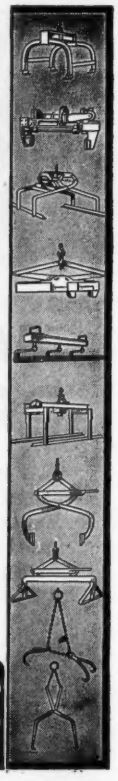

Mansaver Industries, Inc., 3103 East St., New Haven, Conn.

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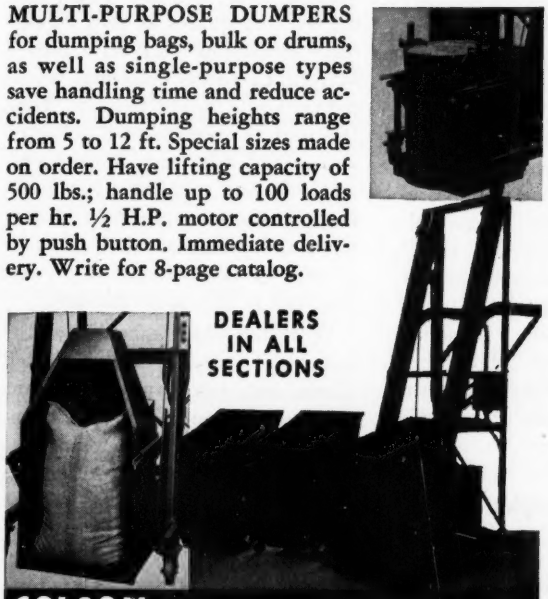
MULTI-PURPOSE DUMPERS for dumping bags, bulk or drums, as well as single-purpose types save handling time and reduce accidents. Dumping heights range from 5 to 12 ft. Special sizes made on order. Have lifting capacity of 500 lbs.; handle up to 100 loads per hr. ½ H.P. motor controlled by push button. Immediate delivery. Write for 8-page catalog.



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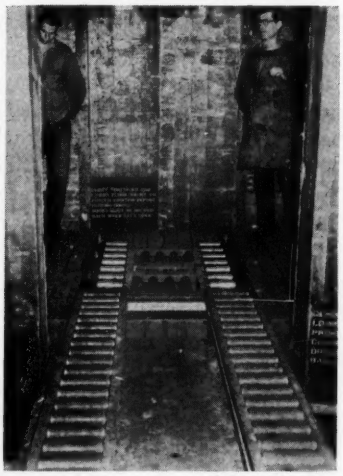

Designed for use in conjunction with unloading and loading palletized loads to and from all types of railway cars. Where the Fork Truck ends the Pallet Dolly starts.

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MATERIALS HANDLING ENGINEERS
335 Water Street, West Bend, Wis.

small trucks are used which have a steel frame bed that is 18″ x 24″. These compact vehicles are designed both for our small skids and the narrow aisles maintained between closely spaced machines.

From the discharge ends of the annealing furnaces the cooled pieces are removed with a hand hook and packed (stacked side by side) in steel tote pans, or trays, making an average load of approximately 60 lb. per unit. These containers are loaded on 23″ x 23″ skids and then moved to temporary storage preparatory to the cross roll operation. All moves are short, in many instances only a few steps, and hence the hand-truck-skid system fits the requirements in this department.

Typical Examples

Let me elaborate on a point or two mentioned earlier. One concerned further handling refinements. In an area where available space and the stage of the manufacturing allows, such in-process material will be handled by mechanical means. This will be done in order to conserve manufacturing space by stacking the trays high.

It was also mentioned previously that the introduction of up-to-date handling facilities was largely dependant on the prior application of modern production machinery. If the bulk of the production equipment were designed for old-fashioned manual piece-by-piece operations, "handling in quantity" methods between machines would have obviously been out of balance with the production capacity. Thus high-capacity, modern rolling machines and automatic plating equipment, to give two examples, had to precede the equipment for mass handling.

In the subsequent part of this discussion a detailing of minute processing steps will be avoided, as this would entail repetition of handling procedures. Instead, the writer will describe flow procedures which are typical, though not necessarily related.

After the pieces are fed to the cross roll machines, and others, the flatware emerges in a "packed" form—that is, placed in an orderly manner side by side. The pieces are held by guides as they emerge from machining and slide into a hairpin. Up to 200 individual pieces are thus held by one hairpin. When this unit has been filled it is locked and placed in a cross-stacked pattern on a 23″ x 23″ skid for movement to the machines next in line. Here the pieces are fed into the process by the "hairpin unit", and removed in the same manner.

With the older machinery, the individual pieces were ejected "loose" into tote pans. This meant that they had to be taken to a central station where the packing was done manually, which entailed a great deal of rehandling. Thus the hairpin is an effective device for the "unit" handling of thousands of small in-process pieces.

Automatic Dipping Conveyor

To leave machining, here is an example from a cleaning (bright dip) operation. Prior to entering the pneumatic drop hammer department, all flatware is dipped mechanically in a series of tanks arranged under the oval circuit of a chain conveyor. For racking the pieces at this station, a 33-ft. long double deck gravity roller conveyor is used. The work rolls ahead on the lower deck, and the empty racks are returned on the upper one. The work is supplied to these operators in steel tote pans, and the wire racks are positioned in slanting frames for convenient insertion of the individual pieces.

The lower conveyor bed makes a 90-degree turn to the overhead cleaning conveyor, The track of the latter is mounted on a hydraulic ram, which is lowered and elevated by a series of interconnected switches which also control the conveyor travel. It must be borne in mind that this conveyor serves simultaneously for dipping the loaded racks at one side and discharging the completed racks at the other side.

The loaded rack arrives on a roller shuttle table, which advances one length. It is now in position to be picked up by the dual adapters (inverted T's) suspended from chain conveyor. The forward travel of the latter stops momentarily, whereupon a pair of the adapters descends. As they advance, they pick up the full wire tray, which is then successively elevated, advanced and dipped. As a full rack is picked up to enter the cycle, another rack is discharged on a roller table across from the one serving for the loading operation.

Conveyors Coordinate Buildings

After the last buffing operation in the "half finish" department the flatware is deposited in wooden trays. From here the material must be delivered to the plating department, which is located in a separate building. The transfer is accomplished by means of a 14" x 300' rubberized belt conveyor, part of which is also shown in one of the photos.

This line travels from the half finish department out of the building, then through a tunnel under a roadway, whereupon it enters an adjoining building and travels up to the third floor where the plating is done. The arriving trays of work are discharged from the delivering line on a gravity roller section with a limit switch. When the rollers are filled up (and no operator is in attendance) the switch stops the conveyor and thus prevents spilling of the containers.

From this point the trays are sorted by types of flatware, which is then racked up for the overall plate and spot-plate processes. Inspection, packing are done in another building.

Engineered for Many Requirements

Thus the containers, the transporting equipment and the methods are adapted to the materials, the production requirements, available space, the building locations, and to the changes the ware is undergoing in the rather lengthy processing cycle. It will have been noted, for example, that the light-duty bridge crane in the raw material receiving area partially compensates for the absence of a truck dock. Both the pallet-fork-truck and the skid-hand-truck methods have their place in the general production scheme. As long as racking for annealing is done in the present manner, the hoist-suspended drum jig is doing an efficient job in feeding the work to these operators. Similarly, the steel tote pans, the hairpins and the wooden trays give us "unit" handling, at the same time satisfying the requirements for careful craftsmanship and product protection. Finally, gravity and power conveyors are integrated into the flow wherever the demands of material movement are best met in this manner.

In the meantime, our Plant Layout and Industrial Engineering departments are continuing special studies for the more effective application of flow principles in particular departments.

(The second of two reports on Oneida Ltd. See "Centralized Receiving for Supplies", December, 1949.)

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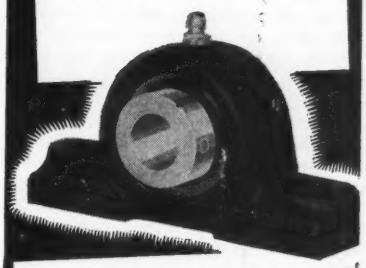

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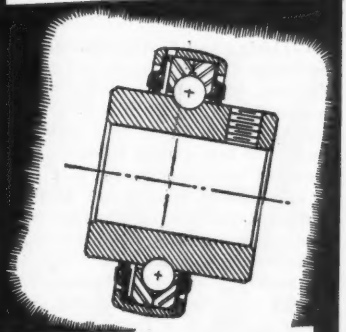

Roberts bearings are sold in pillow blocks and flange units, or by themselves for use in your own stampings or housings. Either type is excellent for conveyors, farm machinery and similar applications. Write for catalog, engineering advice and prices.

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The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Gravity Conveyors . . . A 10-page booklet by the Wilkie Co. This informative publication contains construction data on its line of gravity conveyors, of the roller, wheel and chute types, in both telescopic and standard models. More than two dozen drawings supplement the detailed text. Subjects covered include design of conveyors, proper selection, and typical layouts. Conveyor accessories such as couplings, stands, guide rails and mobile units are discussed. Use the post card bound into this issue for further information.

26—Pallets . . . A brochure from the Williford Mfg. Co. gives information on five types of pallets. These are the flush type—reversible; flush type—non-reversible; full-open wing type; semi-open wing type, and four-way entry pallet. Individual features and a picture of each kind are included. Construction properties are also listed. Many pictures show typical installations. The subject of chamfering is discussed.

27—Timing and Sorting Device . . . A two-color folder, issued by Pratt & Whitney, illustrates and describes its Syncro Timer. The unit is a remote control timing device that will direct, classify or sort almost anything that is produced continuously or that travels on a conveyor mechanism. It is self-contained and driven directly by the mechanism so that acceleration, deceleration or stopping does not affect the accuracy of its performance. According to the release, the Syncro Timer is built to withstand hard usage and requires very little maintenance. The publication is available free upon request to FLOW Magazine.

28—Drop Bottom Skid Boxes . . . Monroe Auto Equipment Co. will send information on its line of drop bottom skid boxes. They are designed for the gravity flow of stampings, castings and other small parts into the waist-high tray of the matching work stand. The parts flow from the slanting floor of the boxes. The containers can also be used as conventional skid boxes or easily moved on or off separate work stands by high lift trucks. They are available in six different sizes and weights; the position of the skid openings may also be varied. The company offers other publications on its two and eight-way steel pallets; collapsible wire and standard skid boxes; standard plaftorms, skids, nesting rings and accessories.

29—Crane Control System . . . A four-page bulletin, available from the Whiting Corp., discusses the features of its crane control system. This method of control employs small master switches and solenoid starters. Features are stated as follows: operator can work while seated; easier, less fatiguing operation; unobstructed view from the cab; full safe motor power; designed for A.C. or D.C. current; and reduced weight. More than a dozen photographs supplement the text. This publication is designed for production and maintenance men, superintendents and others who are responsible for the efficient operation of traveling bridge cranes.

30—Wooden Shipping Containers . . . "From Log To Laboratory To Your Shipping Room" is the title of a pocket-size booklet offered by the Atlas Plywood Corp. The text describes the raw material and the processing methods necessary to adapt the lumber to its finished form. Photos show in-process views and testing operations. Eight pages are devoted to application pictures showing the containers with products ranging from furnaces and ice cream cabinets to engines and vending machines.

31—Pak-Loader Fork Truck System . . . The Yale & Towne Mfg. Co. has announced a four-page bulletin describing and illustrating its Pak-Loader Fork Truck System. Twelve pictures and four drawings illustrate the application of the system to the transporting and tiering loads of sacks, cartons, bails, and drums. The fork trucks are equipped with pusher mechanisms and several steel plates. The operation of the pusher device is explained in detail. Use the post card bound into this issue for further information.

32—Ball Bearing Units . . . Brochures offered by Roberts Machine Works contain data on a series of ball bearing units available for medium loads and shaft speeds up to 1000 R.P.M. Both pillow blocks and flange units are available in sizes for shafts from ½ in. to 1½ ins. in diameter. Their one-piece housings are of heavy-duty cast iron. They are equipped with grease fittings, and felt seals are designed to retain the lubricant, while protecting against the entrance of foreign matter. They are also designed for normal misalignment of the shaft. Both pillow blocks and flange units are specially recommended for conveyor equipment and all anti-friction work at low speeds and with light loads.

33—Fork Trucks and Tractors . . . The Clark Equipment Co. has released a booklet describing its line of fork trucks and industrial tractors. Data has been arranged for easy comparison between various models in the company's line. The publication is divided into five sections, each containing drawings, specifications and descriptive text. 1. Gas-powered fork lift trucks. 2. Battery-powered fork lift trucks. 3. Gas-powered towing tractors. 4. Gas-powered dump tractors. 5. Attachments and devices. The last section presents paper scoops, rams, crane booms, clamps, scoops, brick and rotating forks and pusher devices. Use the card bound into this issue to obtain your copy.

34—Belt Conveyors . . . The Belt Corp. will send a folder on its Handy-Handler, lightweight belt conveyor. The equipment is available with rubber or steel link chain belts and with gasoline or electric detachable power units. Construction features include: a bail at one end of raising, lowering or hanging; sealed, ball and needle bearings; rust-proof aluminum-alloy structure; deep flared side with 6¼" trough; removable hopper sides. The publication contains many illustrations, and a chart of handling capacities for various materials at different angles of elevation. Drawings show the unit used for loading and unloading bulk materials from rail cars and highway vehicles, stockpiling, filling hoppers and bins, and feeding other conveyors. This publication is available free upon request to FLOW Magazine.

35—Hand Trucks . . . Catalog T-49, released by The American Pulley Co., contains valuable information on its line of standard and specially designed hand trucks and industrial wheels. A chart covers 27 different types of loads, the recommended average load ratings, and the model to be used. Loads range from drums, appliances and tanks to single bags, cans and packages. Types of models which are available include light-duty utility vehicles, warehouse, box and barrel trucks, bag and grain trucks, and railroad and stevedore heavy-duty trucks. Other sections, which include photos and specifications, feature trucks for case goods, cartons, drums, carboy vehicles, and barrel and drum cradles. The publication also features photos and data on special purpose vehicles for handling welding tanks, appliances, cotton, small mer-

chandise and machinery. A section is devoted to rubber-tread, pressed-steel and semi-steel wheels.

36—Overhead Handling Equipment . . . Monorail, cranes and auxiliary equipment are the subject of a catalog issued by the Industrial Monorail & Conveyor Co. The publication is divided into three sections, with numerous pictures supplementing the text. The section on monorail treats rail sections, track splices, curves, end stops, clamps, switches, turntables and trolleys and their components. A page is devoted to various types of hoists. The second grouping details overhead traveling cranes and components, swinging jib cranes, and manual and motor-operated gantry cranes. Buckets, grabs, racks, chain slings, monorail scales, dipping sections and lift sections and towers are included in the section on auxiliary equipment. The publication may be obtained by mailing the postcard bound into this issue.

37—Vehicles For Construction Jobs . . . A two-color folder is available from Mixermobile Manufacturers. It pictures and describes four models of vehicles designed for transporting, lifting and pouring concrete, dumping dirt and other bulk material, stacking lumber, and grading operations. Each model is pictured with text explaining particular operations for which it is suited, and construction and operating features. This publication is designed for the information of those interested in efficient construction operations, yard handling, and in-plant handling of bulk materials.

38—Positioning Equipment . . . "Material Handling At The Machine" is the title of a 12-page booklet issued by Lyon-Raymond Corp. It contains illustrations and descriptions of 12 types of equipment of various manufacturers and how these may be used to position materials into machines. Equipment ranges from two-wheel hand trucks to traveling bridge cranes. Two process charts serve as examples for determining the extent of handling from receiving to shipping. The relation of positioning operations is stressed. For your copy, mail the postcard bound into this issue.

39—Power Conveyors . . . A brochure is available from the Bean-Cutler Division of the Food Machinery Corporation. It describes and illustrates its line of power conveyors showing various applications to different production operations.

40—Diesel-Electric Locomotive . . . A new 16-page bulletin, describing the 80-ton diesel-electric locomotive for industrial switching has been announced by General Electric. The richly illustrated literature describes the model and points out features of the unit. Charts show capacities, specifications and a breakdown in costs. The locomotive has a maximum speed of 30 MPH; single motor connections with simple control; full engine-horsepower utilization to 16 MPH; smooth output curve; and double-reduction drive. Several pages are devoted to construction features coinciding with explanatory photographs. Photos also show components and industrial applications.

41—Wood Splint Pulley . . . The Menasha Wood Splint Pulley Co. has issued a catalog describing its line of Lawson Splint and Rim Pulleys. Detailed descriptions of the different items together with their particular applications are given.

42—Flexible Couplings . . . A new catalog on Baldwin-Rex Roller Chain Flexible Couplings by the Chain Belt Co. The publication presents a detailed story of these couplings—their design, application, selection. To clarify design and application features, cutaway, "explosion" photos and drawings are used.

43—Electric Counters . . . The Production Instrument Co. has released a 16-page bulletin showing its electric counters. Illustrated are applications for counting parts, cartons, mechanical operations, oranges, folding machine production, etc. Illustrations show both photo-electric actuation and operation with specially-designed actuating switches.

44—Filling and Weighing Equipment . . . News of electrically operated filling and weighing equipment is presented in a leaflet issued by Cass Products Co. Specifications, operating features, and advantages of various models are listed.

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These rugged American Hand Trucks are rolling along after ten or more years of hard service . . . at original cost of less than a penny a day!

- ✓ Pressed-steel bolted construction—keeps maintenance costs down to a minimum.
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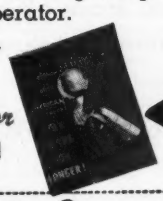

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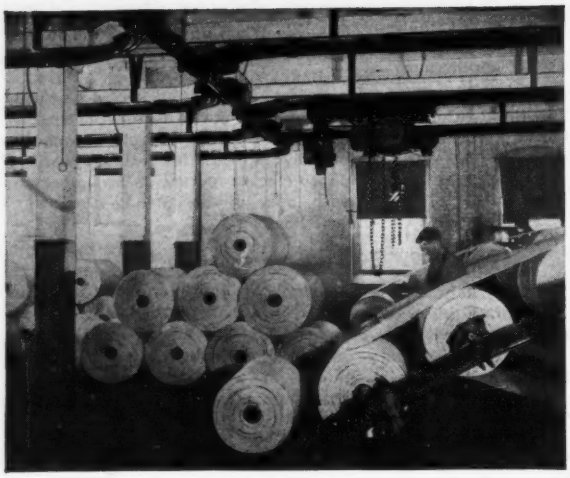

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If your processing operations call for lifting or moving of loads up to 3000 lbs., Coburn can eliminate many "back-breaking" problems.

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CF&I

ON THE PALLET . . .

(Continued from page 38)

sented in a booklet entitled "Computing Return on Invested Capital, A Study in Machine Tool Arithmetic," the method carries shop computations of annual savings effected by a new machine tool on through the additional computations dealing with depreciation and Federal income taxes, in order to arrive at estimated net return over a ten-year period, the probable profitable life of the new machine. The publication may be had by writing the Association at 10525 Carnegie Ave., Cleveland 6, Ohio.

THE purchase of electric industrial trucks from the Automatic Transportation Co. for use in the modernization program now underway in the port of Haifa has been announced by Israel Benozer. Benozer is representative of the Ministry of Transport and Communications, Hakirya, Israel. He traveled through the United States, studying American port facilities and techniques, and at the same time he supervised the purchase of essential equipment. The purchases are part of Israel's port improvement program, designed to make Haifa the equal of western world ports, after which it is being patterned. When present plans are carried out, present capacity of the port of Haifa will be at least doubled, it is said.

ROBERT ABEL, president of Robert Abel, Inc., Boston, died recently. The company is one of New England's leading distributors of material handling equipment. Until the fall of this year, Abel was treasurer of the New England Chapter of the Material Handling Institute.

A UNITED STATES International Trade Fair, the first international exposition for industry and commerce ever staged in this country, will be held in Chicago, August 7 to 19. Aided by the U. S. Department of Commerce, the fair is expected to be the greatest single stimulus to international trade yet in prospect. The purpose of the new fair is to provide an economical and productive medium for the sellers of the world's goods to open the American market. It will be the first time in history that foreign producers will be able to meet a concentration of American buyers. A ratio of one-third American exhibitors to two-thirds exhibitors from the rest of the world has been set by Fair officials. Exhibits have been classified into 29 categories of products, and space will be assigned according to classification. Exhibits will be grouped by category and not by origin. The Fair will be housed in four permanent Chicago exhibition halls: Navy Pier, International Amphitheatre, Coliseum and Arena. Free bus transportation between the halls will be provided.

PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

CONTENTS

PROPER EXPORT PACKING DEVELOPS FOREIGN TRADE—Results of the first extensive study of American export packing, sponsored by the Maritime Association of the Port of New York. Shipments are reported on by container groups. It is interesting to note that the most serious drawbacks result from secondhand or improperly prepared containers, which under normal circumstances would give satisfactory service...72

THREE BENEFITS FROM PACKING PROGRAM—How the manufacturer of a garden tractor stabilized production, lowered inventory and decreased storage space. The key point in this project was an engineered package which eliminated former wastes. 74

ACCUMULATION CENTER FOR SELECTIVE SEALING AND SHIPPING.—A single case sealing machine with an adjustable compression unit serves for various sizes of shipping containers from four packaging lines. Overhead storage lines and an accumulation conveyor are designed for one-man control of the entire operation. 76

PACKAGING MECHANICS SECTION

Proper Export Packing Develops Foreign Trade

THIS first extensive study of American export packaging is of interest to everyone concerned with packaging, shipping, handling, insuring and exporting. This condensed version of Report I represents the New York export packaging study of U. S. export packaging and handling by the Packaging Committee, Maritime Association of the Port of New York. The committee was appointed last February to determine what action could be taken to solve deficiencies in export packaging methods. Some typical questions studied: Is it a problem of packing or handling? Does breakage happen here or overseas? How can the problem be solved? This summary is of observations that were made at New York before and during the loading of test vessels. An additional report will be made on the analysis of outturn reports which are now being studied. The establishment of a permanent packaging bureau to render technical service to shippers and carriers will depend on the findings of the committee.

Conclusions Important To Every Shipper

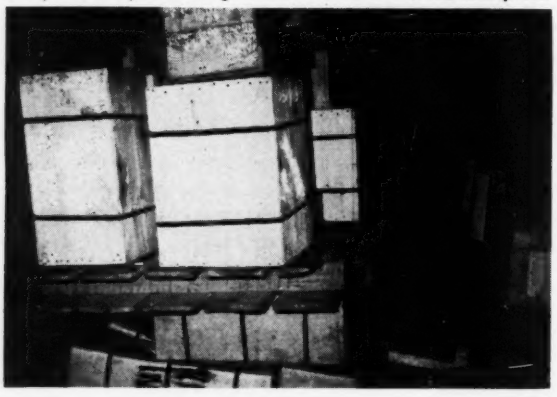
FOLLOWING are the main conclusions of the committee which included representatives of shippers, underwriters and steamship companies. A surprisingly large number of shipments arrived at the piers already damaged or so poorly packed that it was not reasonable to expect good outturns. Some shippers seemed to think they were putting one over by sending merchandise improperly packed, while actually the ones being fooled were the shippers themselves.

The extremes of packaging and handling were serious and too numerous. Poor outturns damage the reputation of the shippers and of the American exporters in general. Proper export packing develops foreign trade. The right way is always the least expensive. Most poor export packages could be good ones at the same or lower cost; some will cost a little more.

Shippers are not expected to do the whole job themselves. There are pier handling conditions which it is unreasonable to expect a package to withstand.

While there were some well-packed commodity groups, there were some with a lesser number of poorly packed shipments which were at the same time also without any well-packed shipments. Considering the total number of shipments in each type of container, the containers can be listed as follows (starting from the poorest): NOTE: Actually, each of the types of containers would be satisfactory under normal conditions if fabricated and used in accordance with good practice.

Example of bad pier handling. The result is shown in the next photo.



Crushing of the cartons loosened steel banding, inviting damage loss.

Comments By Container Types

The following comments are based upon observations of cargo during the New York surveys only:

Nailed Wood Boxes. When properly used, wooden boxes do everything that should be expected. Poor wood (large knots, poor grain and green lumber), light or improperly applied straps or incorrect use of the right nails can spell failure. Long spans must be supported and the boxes must fit the load. Except for boxes of special design they should not exceed 800 pounds. The best boxes are limited to 300 pounds gross weight or less. Straps, especially stapled, are preferable to thicker lumber.

Corrugated Cartons. Corrugated cartons can make reasonably satisfactory export containers if properly used. They require much greater care than any other type of container. The principle weakness observed was poor closures. The second weakness was lack of stacking strength due to weak cartons, poor closures or inadequate interior packaging. It was observed that 200 pound test cartons were not satisfactory.

Solid Fibre Cartons. It was observed that all solid fibre cartons were much better for export than corrugated cartons. V-us containers are too seldom used. Exporters often use V-us in place of wood for light weights. Some shippers pack their domestic cartons in V-us containers for export.

Cleated Plywood Boxes. Most of the poor shipments in plywood were in secondhand boxes. They were overloaded, improperly closed and inadequately strapped. Many had broken panels, loose nails and ripped cleats before reaching the pier. Quarter inch (and some 3/16 inch) plywood cases seemed satisfactory under 400 pounds if correctly closed and strapped.

Wood Cleated Fibre Boxes. Comparatively few shipments were observed in cleated fibre; they were mostly secondhand.

Open Crates. Open crates are seldom satisfactory. The hold down methods are inadequate, the wood knotty or poorly grained. The design is usually box type and too light for the contents.

Sheathed Crates. Sill type bases leave the floor boards to get loosened and pulled off. Skids are usually adequate, sometimes larger than needed. Crate tops are often weak and corner construction poor. Corner posts, diagonals and vertical sheathing are necessary. Most sheathed crates look rugged but may be damaged by well-intended handling before their weak points are appreciated. Marks for proper slinging are helpful in this connection.

Wirebounds. Open wirebound crates are often better than regular open crates; they are too often used for ranges, washers, etc. Wirebound boxes are excellent as export containers when using domestic cartons as interior packages. They are often too large for the contents. The ends are the weakest part.

Steel Drums. New drums are excellent. Closures must be done as prescribed. Light drums are subject to denting and leakage. Secondhand drums (other than I. C. C.) are usually unsatisfactory.

Fibre Drums. Fibre drums are satisfactory when correctly used. Closures are important. They should not be used for hardware, paraffin and similar items. Fibre drums must be kept dry.

Wooden barrels, casks or kegs. All new barrels observed were doing a good job; reinforcing head cleats are very desirable. Secondhand barrels are not satisfactory for export.

Bales. Under normal circumstances, with reasonably good handling bales should carry well, although hook and water damage can readily develop and pilferage is common.

Bundles. Straps and ties are too often inadequate, too loose and not properly closed. Skidded bundles of sheet metal are easily damaged. Wrappings and closures of other bundles are very poor. Bundles of packed cartons are seldom satisfactory.

Paper Bags. The closures, shoulders and seams of paper bags are often poorly made. Some wire closures leave exposed ends which cut the paper. Overloading is also a fault. All bags are subject to easy puncture but creped kraft in multi-walled bags gives good resistance.

Markings. A great deal of the marking of packages is inadequate, some confusing, some is difficult to locate and to read. Many shipments have too much advertising printed on the packages.

Pier Operations

During the course of the New York surveys many observations were made of the pier and stevedore operations which are summarized below:

Truck Deliveries. It is estimated that more than half of the damage to shipments at New York is caused by poor unloading of the trucks. Any carton over 100 pounds and any wooden box over 300 pounds will usually be injured during unloading. In this connection, it should be understood that the unloading of the truck is an obligation of the shipper or his agent. Accordingly, it is in the interest of the shipper to make certain that a qualified truckman is engaged and that the trucks employed are adequately manned to assure careful unloading of the cargo and, in the case of heavy lifts, are properly equipped to provide a safe unloading, as opposed to the practice of "dumping cargo off the tailboard."

Storage on the Piers. Examples of poor storage were observed. Heavy wooden boxes or crates placed on top of corrugated cartons. Poor palletizing, with the cartons extending half their width over the edge of the platforms. Cargo stacked with no regard to arrows and other marks. Short or no dunnage between sheathed crates and

(Turn to page 78)

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NEW! NO. 1 SPECIAL OVERSIZE OUTFIT
(same as Standard No. 1) prints 8 lines 3¼" long, $12.50

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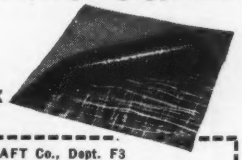
FIBREEN GIVES
COMPLETE
PROTECTION

Whether you ship by truck, train, boat or plane, FIBREEN will provide your goods with complete protection from costly damage in transit *and* in storage. *Any* shipper of *any* commodity may have packaging problems that can be solved by this strong, moisture-proof, dust-proof, reinforced sheet. FIBREEN is saving money for many shippers. What is your packaging problem?

WRITE FOR
32-PAGE BOOK
and SAMPLES



The SISALKRAFT Co., Dept. F3
205 W. Wacker Drive, Chicago 6, Ill.
Please send a copy of The FIBREEN Book.

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Firm Name_____

Address_____

City, Zone & State_____

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Chicago 6 • New York 17 • San Francisco 4

This Packaging Project { stabilized production / lowered inventory / saved storage space

The data on which this article is based were obtained in consultation with the Choremaster Division's Vice President L. L. Weber, Plant Superintendent T. L. Franken, and Assistant Superintendent Harold Siebert.

Sound package engineering can contribute toward stabilized production, lower inventory, and economical use of warehouse space. An engineered package for the Choremaster garden tractor accomplished these results, besides facilitating shipping and distribution problems.

THE complete Choremaster garden tractor is now assembled for shipping in three different packages, as follows—(a) engine, (b) chassis and (c) handle box. Prior to the present packaging project, the engine was assembled to the chassis. With a total weight of 107 lb., both were formerly shipped as one unit in a crate. The handles, weighing 10 lb., had always been shipped separately. The only difference in this respect is that more recently a change was made to a container of better appearance.

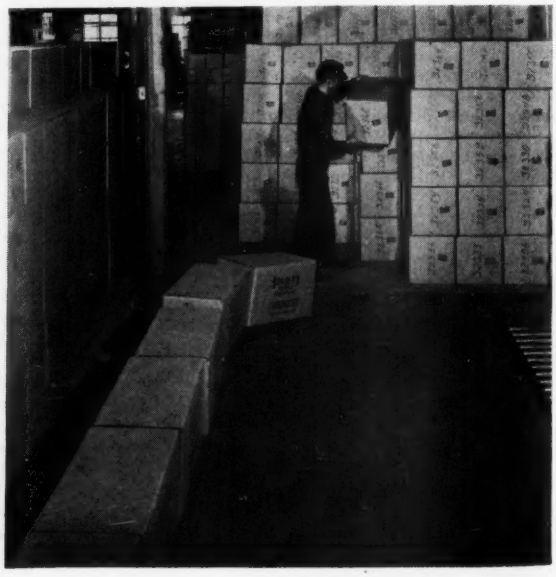
The results of the present packaging method have been far-reaching. 1. Thousands of dollars worth less engines need now be carried in stock. 2. Former peak assembly periods have been evened for a balanced production schedule throughout the year. 3. Economical use of storage area saved 33 per cent of warehouse space, which is needed.

Serious Difficulties to Be Overcome

The crate that was previously used for the combined engine and chassis assembly was an open type, with the following dimensions: 30" x 18½" x 28". With a production rate of approximately 100 garden tractors per eight-hour shift, five men were required for making

OLD METHOD of stacking crates—this involved a large inventory of engines.

NEW METHOD—these cartons of chassis take less space, without engine inventory.



and nailing crates. These operators also did the packing.

The following difficulties were noted. 1. With the tractor made in one, two and three horsepower models on two chassis, a large number of units had to be produced against orders. This, in turn, required an excessive amount of warehouse space. 2. Because of the seasonal nature of the garden tractor business, the problem was to make enough units in the winter to meet the demand in the spring. This involved an inventory of $75,000 in engines, which was inevitable as long as the power unit was assembled to the chassis. 3. Because of the open-crate construction, dust and dirt settled on the equipment. 4. The crated unit was hard to handle, both because of the bulk and weight of the package. 5. Damage in shipping was high. Complaints were received on crates that had come apart in repeated handlings. 6. The open crate had a tendency to encourage pilfering. Complaints stated that such items as gas tank caps and carburetor filters were missing.

Solution Via Packaging

Could a different assembly and packing method be devised which would obviate (a) the need for the large inventory of engines, (b) excessive storage space and (c) certain drawbacks that developed in handling and shipping? It should be explained that the crate which was formerly used had so much air space that only 66 per cent of the load capacity of delivery vehicles could be utilized.

The next possibility considered was: Could the chassis be shipped in a totally enclosed box? This was tried with a corrugated carton which had approximately the same dimensions as the crate. The disadvantages were: 1. The cost of this carton was higher than that of the crate (largely because of the wooden pallet required). 2. The amount of unused space had remained the same. This approach was immediately discarded.

After a series of conferences by members of the management, the question was finally refined to this point: Why not change the assembly method in order to make possible a more efficient package at reduced cost? This point can also be stated in reverse, namely: Why not develop a different and simplified package that will help simplify the present assembly method? This proved to be the correct approach. The decision was made to box the chassis and the engine separately, which would automatically cut down on the inventory of the latter. And it would be easier to handle the two smaller packages than the one large crate.

A test run made in May of 1949 produced excellent results. The chassis is now shipped in a 26½" x 14½" x 14" corrugated shipping container with overlapping flaps, making a shipping weight of 56½ lb. Seven scored stuffers (which are stapled) make a firm interior pack. The carton flats are set up by two operators, who also do the packing.

The engine is now shipped in the original carton sent in by the manufacturer. The changeover required minor modifications in the assembly operations, which simplified this part of the job by eliminating two steps. 1. The engine is no longer assembled to the chassis (nor does it have to be removed from the box). 2. Special assembly of the gas tank is likewise a thing of the past. It is now assembled to the power unit by the engine manufacturer.

I brought him over here—why can't you change him.

The total cubic space taken up by the two boxes is 1/3 less than that taken up by the old crate. Allotted time for packing a crate was .55 hours, which included nailing and loading, not cutting the lumber. Allotted packing time per chassis now is .20 hours, which means a reduction of about 60 per cent in the packing time.

Another big factor is, of course, that only enough engines need now be carried in inventory to take care of current production and shipping requirements. A large inventory of chassis can now be built ahead without requiring a large stock of engines, and the extra warehouse space gained is used for storing this production.

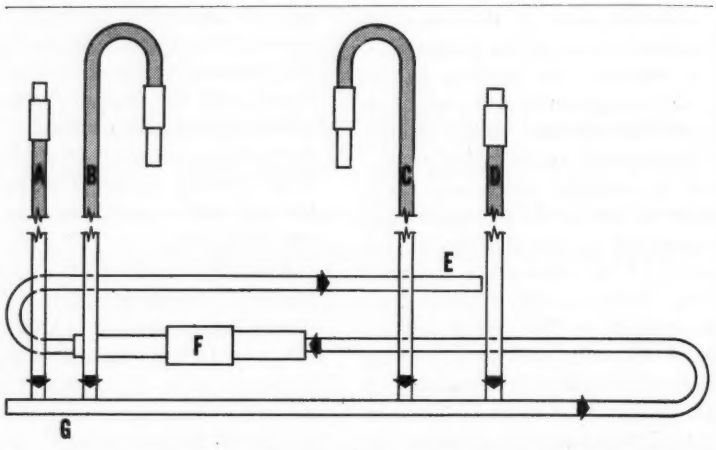
Indirect Benefits

Choremaster distributors likewise gain from the new arrangement. The same number of tractors can now be stored in one-third less the space. Previously, the company made six different models, and it was asked for more. With the present simplified packaging set-up, it is no longer necessary to carry a number of specialized models in stock. The two chassis and three engines can be combined into as many as 12 different models. The dealer carries a minimum number of these standard components and makes up the desired models according to orders. A reduction in the freight rate came as another benefit. While the crated tractors carried first class LTL freight rates, the totally enclosed shipments qualify for second class rates, which represents a 15 per cent saving in freight cost.

This experience of Choremaster demonstrates the beneficial effect properly engineered packaging can have in regard to production, warehousing and shipping—and the operating economies that can result from a down-to-earth study with an unsatisfactory packaging situation.

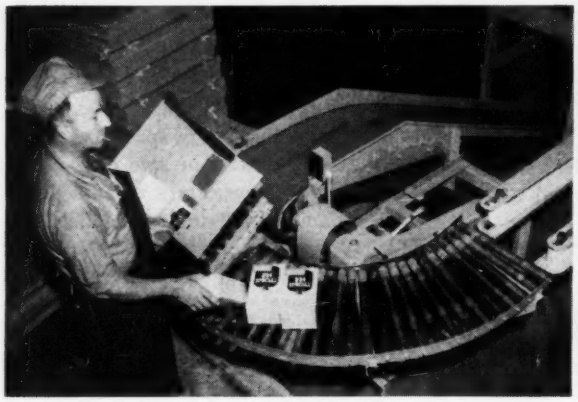
Accumulation Center for Selective Sealing and Shipping

DISPOSAL of full cases from packaging to the order selection-shipping area must be done promptly, economically and on a selective basis in order to (a) accumulate a maximum number of uniformly sized cases for sealing and palletizing, (b) avoid rehandling of individual cases and also (c) congestion on the order selection-shipping floor. At Dr. Hess and Clark, Inc., Ashland, Ohio, leading manufacturer of pharmaceuticals for farm animals, the case sealing and palletizing operation, located below the packaging floor, takes care of the total production from four packaging lines. The entire operation—accumulation, sealing and palletizing—is designed for one-man control, as shown in this photo series.



A, B, C and D are second-floor conveyor lines descending from packing to first-floor sealing, where lines serve for temporary storage. G is accumulation line, F is sealing and compression unit, E indicates palletizing station.

FROM SECOND-FLOOR packing, case is conveyed to first-floor storage line. Electronic switch operates drive mechanism, advances storage line one case length on arriving.



FOUR STORAGE LINES (A) cross room eight ft. above floor, discharges to 90-ft. collecting line (G). System is controlled from switch panel for delivery to case sealer.

180-DEGREE TURN from collector line to feeder line delivering to gluer-compression units. Board retarders break momentum of cases before sealer, foreground.

DISCHARGE LINE with palletizing station. "Walkie" moves load to stock, is adapted to limited floor load. Overhead conveyors give additional storage capacity.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $4.00 minimum, limit 25 words. For all other classifications $4.50 minimum for 25 words, each additional word 15c; boldface type or all capitals, $7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address counts as five words. All insertions are payable in advance.

These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

FOR SALE

THREE ELWELL PARKER ELECTRIC Platform Skid Lift Trucks, Model EQ4, 4000 lbs. capacity. $600 each. Approximately 100 skids, 32"x42", $3.00 each. Will consider lump sum price for lot. Write or wire your inquiries. Lester Kehoe Machinery Corporation, 1 East 42nd Street, New York 17, N. Y. Telephone: MUrray Hill 2-4616.

For Sale: 30" wide motor driven Flat Belt Link Belt conveyor complete with corrugated galvanized steel gallery approximately 7' wide x 7'4" high x 77' long. Belt speed 50' per minute 3HP 440V, 3PH motor 32 ounce 4 ply rubber belt friction surfaced both sides. Priced at $5,000.00 F.O.B. Des Moines, Iowa. DICO CORPORATION, 200 S.W. 16th St., Des Moines, Iowa.

1—Lakewood Tier Lift Truck type 703 capacity 4000 lbs, Exide Batteries—raised height of platform 76".
1—Easton Lift Truck type TL-4, capacity 4000 lbs, Exide Batteries — raised height of platform 74½".
HONEY CO., 680 N. Olden Ave.
Trenton, N. J.

FOR SALE

1—Model TNE 4936 Automatic Electric Transporter. Capacity 4,000 lbs. Platform 20 x 36 x 9" high. Equipped with 6 cell Exide Battery. Both in A-1 condition. A real bargain. Conrad Equipment Co., 2200 Broadway, San Antonio, Texas.

For Sale

Clark 4000 lb. Gasoline Fork Lift Truck —12' lift—New in 1947 ____ $1750.00
Clark 4000 lb. Gasoline Fork Lift Truck —7' lift—New in 1946 ____ $1550.00
Clark 6000 lb. Electric Fork Lift Truck —12' Lift — with two Edison batteries ____ $2350.00
Clark 4000 lb. Platform Gasoline Lift Truck ____ $ 600.00
Crescent Platform Lift Truck—3000 lb. Model LDLF—Electric ____ $ 350.00
Crescent Electric Tractor — Model NTW ____ $ 350.00
Ingersoll-Rand Air Hoists — 2000 lb. ____ $ 150.00

BALCHER MACHINERY CO.
1884 S. Compton Road
Cleveland Heights 18, Ohio
Phone: Fairmount 1186

PERSONNEL WANTED

MATERIALS HANDLING ENGINEER

Well known, sizable steel company in Middle West wishes to secure an experienced Materials Handling Engineer. Should have background of several years experience in materials handling in heavy industry. Must be a graduate engineer. We are seeking an outstanding man. Salary commensurate with background. An unusual opportunity. Replies held in confidence. Please write about background in detail. Box 3350, FLOW Magazine.

MANAGEMENT CONSULTANT

Materials Handling and Industrial Engineering Experience

We plan to add to our professional staff an outstanding man with a strong materials handling background. This background should also include experience in one or more of the following fields: improving manufacturing methods and workplace layout; time study techniques in connection with setting production standards; installation of wage incentive plans; production planning and scheduling plant layout.

Our practice—which started nearly 40 years ago—is experiencing a steady growth, which makes this an unusually attractive opportunity for a man interested in a permanent career in Management Consulting.

This man should be between 30 and 40 years of age, have a good appearance and personality and possess a high degree of analytical ability and imagination. He should be experienced in dealing with top management and capable of programming and supervising consulting assignments.

Location—New York City. Compensation—salary and profit sharing.

Send complete history to Box 3250, FLOW MAGAZINE.

THE EXTRA SERVICE BUILT INTO ALL "WILCO" PALLETS MEANS

MONEY IN THE BANK

FOR "WILCO" PALLET USERS

WILLIFORD MFG. CO.

Box 6095-F, Buntyn Station
MEMPHIS 11, TENNESSEE

LINES WANTED

LINES WANTED

Organization of mechanical, electrical, chemical engineers, own building 10,000 sq. ft. main industrial street, shop facilities, installation crew, want lines—screw, bucket, roller, monorail, chain, wire mesh, pneumatic crane, elevator, skip, power trucks, others. Have sold, installed all above. Seven salesmen and sales manager. Now exclusive distributor other non-conflicting conveyor lines New York, New Jersey. Kornylak Engineering Corp., 513-521 Communipaw Ave., Jersey City, N. J.

South Bend - Michigan City - Elkhart Representative seeks Material Handling Equipment Lines. Write: Louis H. Hansman, 408 East Pokagon Street, South Bend, Indiana.

15 years established Materials Handling Equipment Company in Memphis, Tennessee, trade territory of Tennessee, Arkansas, Mississippi is open for allied lines for industry. Amply financed. Box 3450, FLOW Magazine.

POSITION WANTED

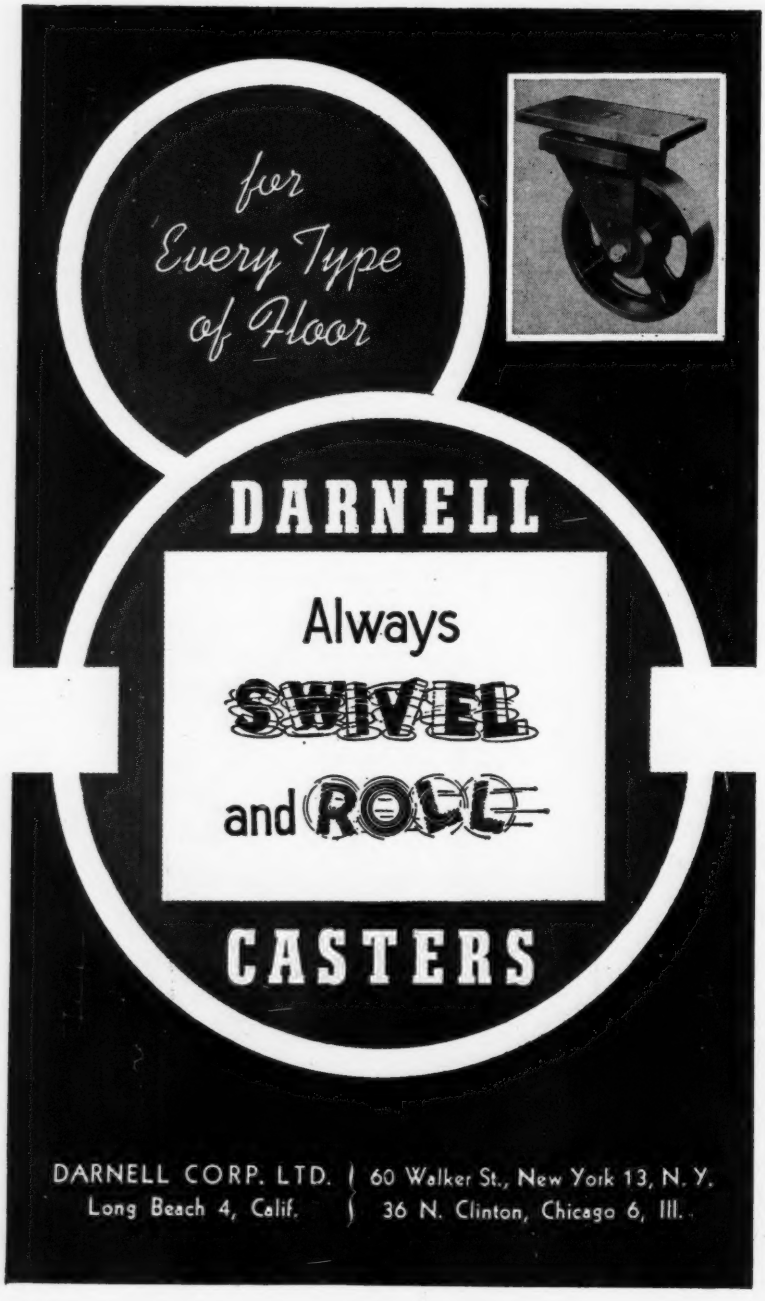
EXECUTIVE—Eleven years experience in Factory and Sales Management. Have experience in manufacture of handling equipment, also its sale on a national basis. Desire position in charge of Sales or Sales Engineering. Box 3150, FLOW Magazine.

EQUIPMENT WANTED

DOLLARS FOR INFORMATION

We will pay 5% commission on all leads furnished to us, which result in our purchase of used handling equipment, such as fork trucks, pallet trucks, cranes, etc. Inform us of such equipment for sale and we will pay you commissions equal to 5% of purchase price if equipment is purchased.

A. & A. MACHINERY CORP.
1267 Flushing Ave. Brooklyn, N. Y.



PROPER EXPORT PACKING DEVELOPS FOREIGN TRADE . . .

(Continued from page 73)

large boxes. Cartons stacked too high, and tipping badly. Packaged cargo just dumped into the piles. Aisles too few or too narrow. Poor grouping of packages and of commodities.

These irregularities in many instances serve only to aggravate an already bad job of packaging and so do not excuse failure of the shipper to provide adequate packaging. In fact, adequate packaging, even under careless handling of cargo on the steamship pier, would in most cases withstand such treatment, or at least minimize the damage now caused by a combination of bad packaging and careless handling.

Handling to the Ships. Fork trucks often damage sheathed crates or large boxes which are not stored on pallets or are poorly dunnaged. The longshoremen sometimes damage packages when breaking out the piles or when preparing the pallet loads. Mobile cranes with dog hooks are often used on the tops of horizontally sheathed crates. Cargo nets are occasionally used on cartons. Rope slings damage plywood boxes. More and better judgment is needed.

In the Hold. The stevedores generally exercise much greater care in the hold than is usually believed. The individual man seemed to do a good job in a difficult situation. The main problem in the hold seems to be lack of equipment. With only their hands and their hooks to work with it is surprising that there is not a great deal more damage. The use of the ships' gear to move large sheathed crates and boxes really tests the all-around strength of these packages. Unless the damage is spotted the instant it happens the packages are quickly turned (by the stevedores) so that the damaged face is down or against the cargo. Many times more damage happens during loading than is generally known.

Stowage. Most stowage and securing of cargo is well done. A better understanding of the strength qualities of packaging would result in better stowage.

• NEW or REBUILT EQUIPT.
• RENTALS IN THE PHILA. AREA

FOR SALE

PORTABLE has the right material handling equipment for the right job! Leaders in equipment sales or rentals, your requirements are sure to be found in our immense stock consisting of cranes, tractors, forks, platforms and pallet trucks either gas or electric.

A card will bring our latest illustrated catalog. We handle the best machines available, and each is job-tested before it is sold, available for immediate delivery. See Portable for a lift!

Sales • Rentals • Service

PORTABLE SERVICE EQUIPMENT CO., Inc.

3519-31 N. FRONT ST., PHILA. 40, PA.

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Pallets, like any industrial machine, can be a profitable asset to your system, IF they do their job efficiently and economically.

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LICENSED MANUFACTURER OF 4-WAY PALLETS - U. S. Patent #2,369,944

Pallets Incorporated

Manufacturers of ENGINEERED DESIGN *Pallets*

Glens Falls, N. Y.

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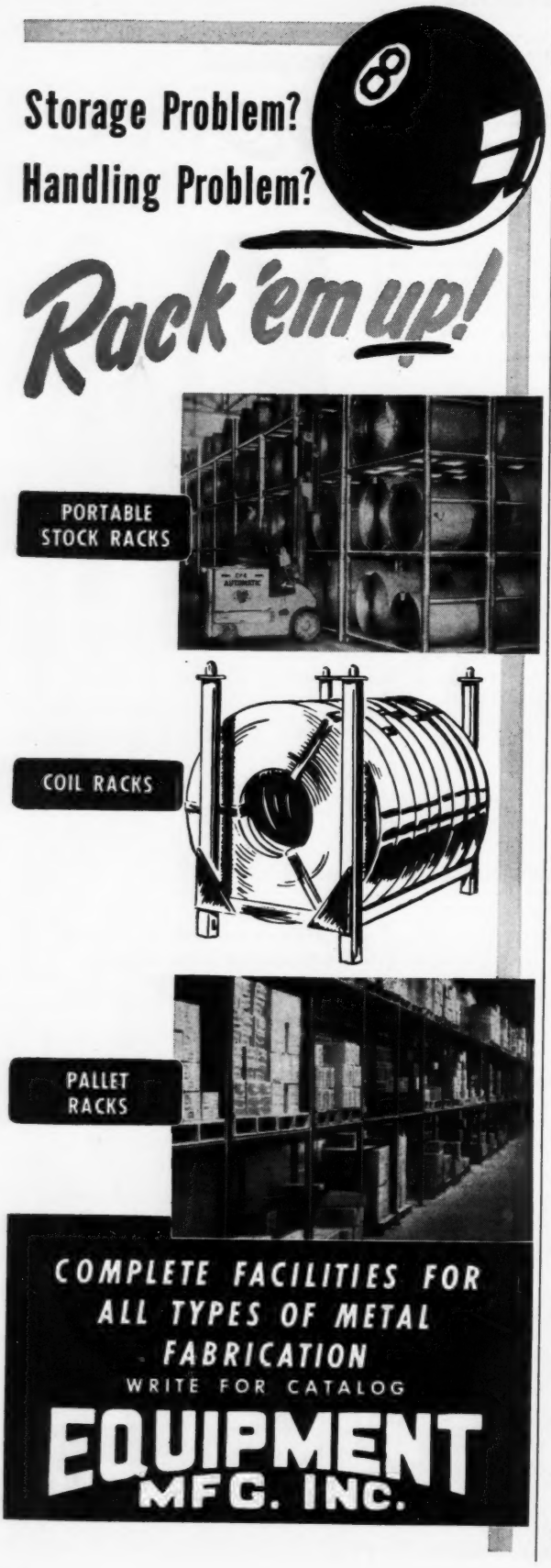
There is no "price" battery in the KW line! KW sells, not batteries but peak electrical efficiency at a guaranteed-in-advance cost!

K. W. BATTERY COMPANY, INC.

3705 N. LINCOLN AVE. CHICAGO 13

Foot of MONTAGUE ST. BROOKLYN 2



Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below.)

A-1. FAULTLESS CASTER CORP. Bulletin No. 52 contains illustrated data on the company's line of rigid and swivel casters.

A-2. BELL AIRCRAFT CORP. This company will send data on its Prime Mover, a powered barrow with interchangeable scoop and platform bodies.

A-3. YALE & TOWNE MFG. CO. offers information on its line of hoists, scales, and platform, fork and walkie-type trucks.

A-4. DEMPSTER BROTHERS. Illustrated folders detail the company's line of baling machines. Use postcard bound into this issue.

A-5. JOHN A. ROEBLING'S SONS CO. is offering data on its new all-purpose sling with the tapered sleeve splice.

A-6. ALLIS-CHALMERS TRACTOR DIVISION. Brochures describe its Tracto-Shovel, Tracto-Loader, and Industrial Wheel Tractor.

A-7. UNION METAL MFG. CO. will send illustrated folders on its four-way entry dump box, also equipped for overhead handling.

A-8. AMERICAN MONORAIL CO. For information on all types of monorail systems, use the postcard bound into this issue.

A-9. TOWMOTOR CORP. will arrange to show its movie, The One Man Gang, to your company. Notify FLOW Magazine, 1240 Ontario St., Cleveland 13, Ohio.

A-10. STEEL PARTS MFG. CO. Engineering data and specifications available on its line of steel-belt conveyors.

A-11. CRESCENT TRUCK CO. An illustrated bulletin describes a fork truck which is designed to maneuver in eight-ft. aisles.

A-12. THE MONROE CO. is offering information on Swift-Floor, industrial floor resurfacing compound.

A-13. DETROIT HOIST & MACHINE CO. Bulletin 810 contains operating data and illustrations on its monorail tractor.

A-14. ROTARY LIFT CO. will send a catalog illustrating and describing its line of hydraulic elevators.

A-15. ROLOCK INC. Folder L contains information on a tote box truck. Use the postcard bound into this issue.

A-16. LANSING INDUSTRIAL SALES CO. A wide range of wheels and casters is the subject of a publication.

A-17. THE SISALKRAFT CO. is offering a 32-page catalog and samples of Fibreen, protective paper.

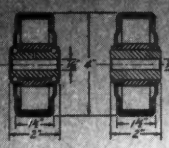
A-18. EQUIPMENT MFG., INC. A publication illustrates and describes the company's line of pallet racks.

A-19. BOSWORTH MFG. CO. For information on conveying and loading equipment use the postcard in this issue.

A-20. RAPIDS-STANDARD CO. Specifications are available on its one-piece, arc-welded steel floor truck.

A-21. NEW DEPARTURE DIVISION is offering a 16-page publication entitled Ball Bearings for Conveyor Systems. Mail the card bound into this issue.

DOUBLE STEEL FLAT TREAD can take shocks from rough floor surfaces, thresholds, curbs, etc. Unbreakable, outlives ordinary wheels.
LUBRICATION to bearings is direct, foolproof, through axle bolt.
NEW
DUST CAP fits snugly to protect bearings from dust, dirt and water, seals in lubricant.
REINFORCEMENT for hub bearing is provided by deep drawn shoulders, pressure fitted to form integral unit.
EXTRA STRONG, deep drawn, corrugated sides will support static loads up to 4 tons per wheel.



Ball Bearing and Plain Bearing Steel Wheels available.

ROUND EDGES are easy on floors, won't chip or break. Wheel is absolutely concentric for smooth operation.

NOELTING

Faultless

DRAWN STEEL WHEELS

Faultless Casters equipped with the new Drawn Steel Wheels provide (1) *longer life,* (2) *greater efficiency,* (3) at *minimum maintenance,* and, thus, (4) *lower operating cost per mile.* They help industry reduce overhead by maintaining fast, fluid production lines. These precision-made wheels are machined to tolerances typical of fine tools and like any quality equipment, are the best investment for long, uninterrupted service. Write for Bulletin No. 52.

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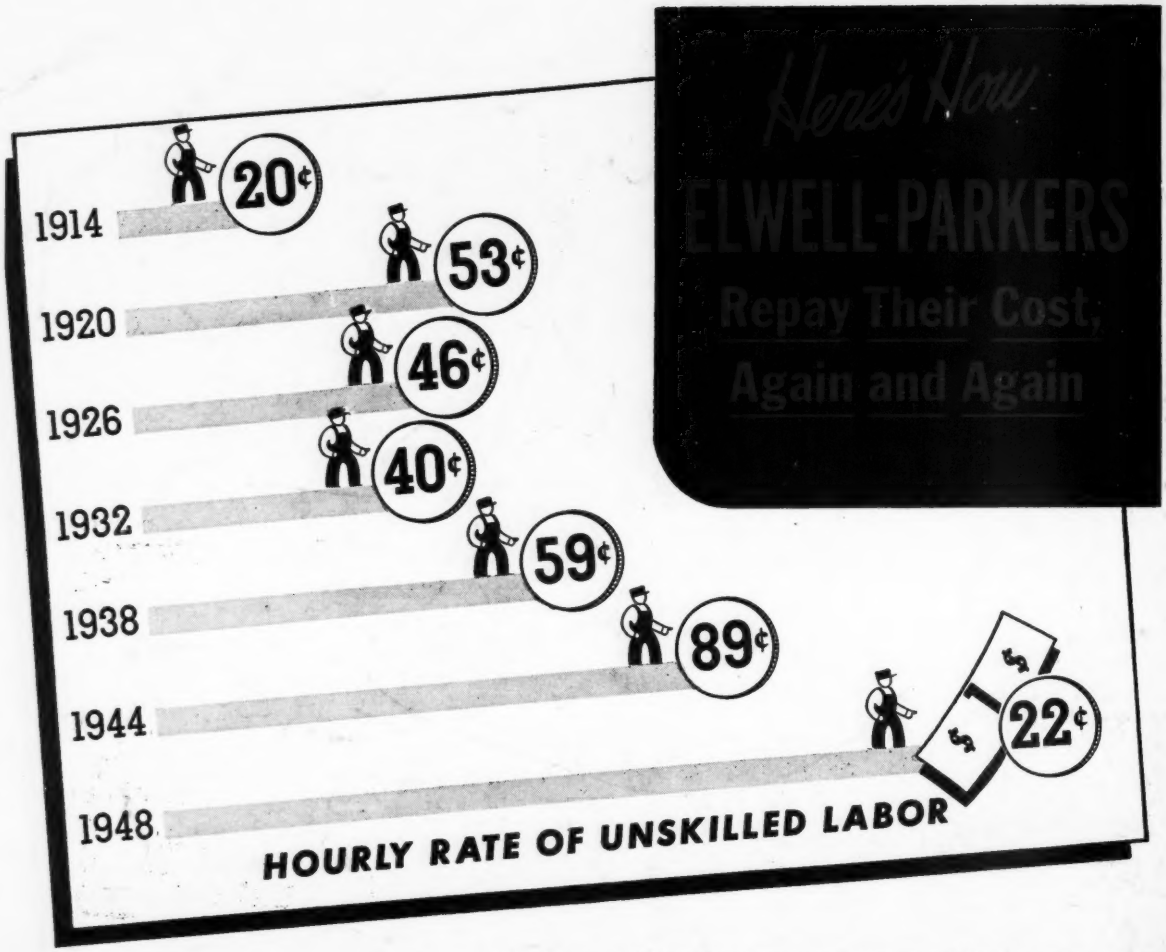

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